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Extensive study of quality of freshmen at University of Michigan undertaken to provide basis for changing of admission requirements. Also presents information on "academic standards" of different units of university and of freshman courses. The following items of information were obtained for each freshman: First-semester grade-point average, grade in each course, rank in high school graduating class, and academic ability test scores.

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UNIVERSITY OF MICHIGAN

Bureau of Psychological Services
Evaluation and Examinations Division

Student Quality, Freshman Grades and the Admissions Problem at the University of Michigan

This was prepared for local consumption but may be of interest. I am sorry many of the pages did not reproduce clearly — the reason is several hundred copies were run and this is one of the last sets.
RGJ

March 1958
122 Rackham Building

ED000299

Preface

A University faculty has a right to expect periodic evaluations of the quality of enrolled students so that it can properly exercise its responsibilities for determining admissions policy and setting admissions standards. This lengthy report to the faculty of the University of Michigan contains a great deal of data on some crucial elements.

A special effort was made to keep the report free of technical jargon and complicated statistics and analyses. Since the basic data are presented in Tables 1 - 24 readers with special statistical training and interest may make additional analyses. The major findings contained in the Tables have been summarized and interpreted in the text so readers who prefer not to examine tabular data will miss very little.

It should be emphasized that the opinions and suggestions found in the latter half of the report are mostly those of one person. Other agencies and persons concerned with the problems dealt with in this report might not come to the same conclusions.

Benno G. Fricke

Student Quality, Freshman Grades, and the Admissions Problem at the University of Michigan

Recent developments on this campus and elsewhere in the world have stimulated increased interest in the kind of student to be admitted to the University of Michigan. There is a rather widespread feeling that the efficiency and productivity of the University could be improved considerably if the quality of enrolled students was altered; many believe greater service to the state and nation would result if this was done.

Members of the faculty have observed that some of the students in their classes are weak, and incapable of satisfactory performance without a lot of special assistance. Frequently they have commented that these weak students make it difficult or impossible to give adequate attention to the strong students. While weak students are usually said to be those who earn (or are likely to earn) grades less than C some faculty members have indicated that most students to whom they give C's are really pretty poor and should not have been admitted.

But since the current admissions policy and procedures purport to admit only "qualified" students, it may not be possible to identify the weak students (if there are such) before classes begin.

The extensive study reported here is intended primarily to supply the faculty some objective information on the quality of freshmen enrolled at the University of Michigan. The study permits an evaluation of the validity of the observations of the faculty and may provide a basis for specifying somewhat more rigorously the kind of student the University will admit and will not admit. It also provides information on what might be called the "academic standards" of the different University units and freshman courses.

The subjects of this investigation were 2,926 freshmen who entered the University in the fall of 1955. According to the Registration and Records Office 2,932 freshmen were enrolled at the beginning of the fall semester so it is apparent that only a very small percentage of freshmen were omitted. An attempt was made to obtain four items of information for each freshman. These were his first semester grade-point average (GPA), his grade in each course for which he enrolled, his relative position in his high school graduating class (specifically his high school percentile rank (HSPR)),[1] and finally his academic ability test scores (specifically his scores on the American Council on Education Psychological Examination (ACE) and the College Entrance Examination Board's Scholastic Aptitude Test (SAT)).[2] The latter two variables (i.e., relative position in high school graduating class and academic ability test score) have for many years been found to be the best predictors of success in college and it is for this reason that they were selected to assess the quality of Michigan freshmen. Scores from proficiency or achievement tests (e.g., Michigan English Proficiency Test) which are routinely given to entering freshmen correlate highly with the measures selected for this investigation. Studies at this University and throughout the nation show that the addition of scores from specific proficiency tests to a combination of scores from an ability test (in many respects a measure of *general* proficiency) and HSPR rarely improves the prediction of success in college. In a heterogeneous population of students proficiency tests tend to supply little, if any, new information. Realization of this is probably one of the main reasons why their use for the selection of students is declining and is not as widespread as the use of ability test scores. Even College Board schools which are very "test oriented" in their selection procedures do not depend heavily upon proficiency tests. (According to data assembled by Joshua A. Fishman, Director of Research for the College Board[3] last year approximately 368,000 applicants took the SAT but only 130,400 took 1 or more of the 11 achievement tests.)

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[1] The HSPR's were obtained in cooperation with the Office of Admissions, and the Office of Registration and Records.

[2] Many academic ability or aptitude tests are called intelligence tests or IQ tests.

Before presenting specific results from the present investigation a few comments concerning prediction of academic success, student selection, and assessment in general may be helpful. Obviously an institution which selects students with *uniformly* high (or low, or average) HSPR's and ability test scores will find them to be of little or no value in *predicting* the academic success of the enrolled students. For example if a college were to select a student body composed of only students who had HSPR's of 43 and 44 (that is, students who ranked as high or higher than 43 or 44 per cent of the seniors in their high school graduating class) and had IQ's of 95 or 96 (that is, intelligence test scores 4 or 5 points below the general population average of 100) then there would be no relation between HSPR and grades in college, and no relation between IQ and grades in college. The grades the students receive would be a result of factors other than HSPR and IQ (e.g., amount of time studied) since these two factors have been controlled. As *predictors* these variables are useless but as *assessors* they are not. They permit a rather accurate description of the quality of students enrolled in the college; and it would be fair to say that the caliber of these college students is quite weak. Qualitywise they are not even average high school graduates, but certain colleges, particularly some of the junior and community colleges have student bodies with averages below the figures cited above. Other institutions such as California Institute of Technology, Harvard, MIT, and Yale enroll freshmen whose average HSPR is about 91 and whose average IQ is about 133.[4]

The concern of this study is primarily with the *assessment* not the *predictive* value of the variables under consideration. An effective admissions policy for an institution such as the University of Michigan probably should have as its objective the selection of a uniformly high quality student body, and ideally it should not be possible to predict probable failure (or success!) for anyone who is *enrolled*.

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[3] Fishman, Joshua A. *1957 Supplement to College Board Scores No. 2.* New York: College Entrance Examination Board, 1957.

[4] About 1.4% of the entire population obtain IQ scores of 133 or higher.

Ideally everyone who is admitted should have an approximately equal opportunity for success and everyone who is refused admission would fail. Those who desire admission but whose prognosis is poor should not be admitted because they are unqualified.[5]

Many major public institutions which previously accepted all applicants are now rejecting or planning to reject weak or unqualified students; most private institutions have been doing so for a long time. But institutions practicing "selective admissions" differ in the methods they use to identify qualified and unqualified students. The weights given to various criteria are not constant.

Most of the independent colleges depend very heavily upon tested aptitude and "clinical judgment" in selecting their students. While the high aptitude test scores of these institutions reflect their dependence upon aptitude tests perhaps they and clinical judgment have been overemphasized.[6] The attitude of the admissions officers of these institutions seems to be that knowledge of the extent of an applicant's high school success is of little importance in evaluating his college fitness. One reason for this attitude is the belief that high schools differ so markedly that HSPR and average high school grade are almost meaningless. Consequently some applicants with relatively weak high school records but high tested aptitude are admitted; these intellectually superior low achieving high school graduates rarely turn out to be outstanding college students--once an "underachiever" always an "underachiever" is the rule. But since students with high tested aptitude generally have performed well in high school their high school record (e.g., HSPR) is, on the whole, quite good.

Most of the state supported institutions which practice selective admissions such as Michigan and California depend very heavily upon the students demonstrated record in high school.[7] The emphasis in the selection criteria is not on what the student might do (aptitude test information) but what the student has done (high school performance). One of the consequences of this is the enrollment of some students with very limited intellectual potential. These dull students frequently have achieved success in high school by being pleasant, burning the midnight oil, handing assignments in promptly or early, not voicing many opinions contrary to the teacher's, etc. But perhaps academically, to paraphrase Rogers and Hammerstein, "They have grown about as far as they can grow." Nevertheless by selecting only students who have done very well in high school the tendency is also to select those who, on the average, have reasonably high tested aptitude.

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[5] These points and related ones have been developed more fully in a paper by Fricke, Benno G. "Prediction, Selection, Mortality, and Quality Control." College and University, 1956, 32, 34-52. It will be sent to interested persons upon request.

[6] The publications of the College Entrance Examination Board (The College Board Review, College Admissions Volumes 1, 2, 3 and 4, and others) very rarely make reference to HSPR and its utility in the assessment of applicants for admission.

[7] The University of California, for example, considers an applicant qualified for admission if his average high school grade is B or better depending somewhat on the high school courses taken. The detailed requirements are announced in California's Catalogs and Bulletins.

Some other colleges specify a certain minimum average on a combination of HSPR and tested aptitude. While this procedure has certain advantages over using either assessment variable alone, care must be taken to obtain an optimum weighting of the two. The College of Science, Literature, and the Arts (SLA) of the University of Minnesota, for example, admits all applicants who achieve a rank (or score) of 40 or higher through averaging their HSPR and their percentile rank on an aptitude test. A student with an HSPR of 20 and an aptitude test percentile rank which places him higher than 60 per cent of the college freshmen in the state of Minnesota would be qualified for admission. A student having an average less than 40 is not eligible for work in SLA but is eligible for admission to the University of Minnesota'a two-year General College.

Correlational and other evidence indicates that too little weight is given to HSPR for admission to Minnesota's SLA (for example very few students having HSPR's below 25 succeed despite high tested aptitude). Studies at Minnesota and nationally seem to show that for superior college performance high tested aptitude is usually necessary but not sufficient.

It is of incidental interest that while the average tested aptitude of Minnesota's SLA freshmen and Michigan's LSA freshmen is almost identical the HSPR's of Minnesota's SLA freshmen are somewhat lower than Michigan's LSA freshmen. There is reason to believe that many of Minnesota's freshmen tend to be "under-achievers" and many of Michigan's freshmen tend to be "overachievers" with respect to intellectual ability.

Now for some specific information on University of Michigan freshmen. A general description of the performance and quality of students enrolled for the fall semester can be obtained from Table 1 on pages 5 and 6. (Frequent reference to Table 1 will be made throughout this report). This table of norms shows, for example, that about 50% of the freshmen (i.e., U of M PR of 50) who obtained first semester grades[8] received a GPA of 2.30 or lower. About 27% of the freshmen

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[8] Of the 2926 freshmen 98 or 3.3% did not earn first semester grades. Of the 98, 80 had HSPR's and the median of these is 84.5 (PR = 45); 89 had ACE's and the median of these is 108.3 (PR = 29). Most if not all of the 98 freshmen can be considered failures and part of the University's attrition for the freshman year.

It is to be emphasized that first semester GPA's have been used for this investigation. This was done because the first semester in college is the crucial one, and because the GPA's obtained in the first semester correlate quite highly with the GPA's obtained in the second and subsequent semesters.

Supplement A at the end of this report presents some preliminary data on the second, third, and fifth semester performance of a portion of the LSA students.

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0	0 00- 44	00-27	00-71	00-42	00-20	40-65	200-00	200-11	20-9	10-11	10-13

obtained first semester GPA's less than 2.00 and about 13% obtained GPA's less than 1.50. Certainly it is clear that the faculty's observation that some weak students were enrolled is correct. But perhaps the crucial aspect is whether it is possible to identify before classes begin (and before they are admitted) those who are likely to be found weak; if it is not, then it is unlikely that the current admissions procedures could be improved. While it is true that there will always be a bottom 5 and 10% in GPA, one of the most important considerations is whether it is possible to specify at the time an applicant is admitted that he is likely to be in the bottom 5 or 10%. Obviously such an applicant should not be admitted.

Figures 1 and 2 are hypothetical distributions of "academic potential" for two groups of students. Students who are lowest in academic potential in Figure 1 are quite likely to be found subsequently in the bottom 5 or 10% in GPA. But in Figure 2 those who are lowest in academic potential are not much more likely to be in the bottom 5 or 10% in GPA than are the applicants who are average. The lowest students in Figure 1 are considerably below the average students with whom they are competing; not so for the lowest students in Figure 2.

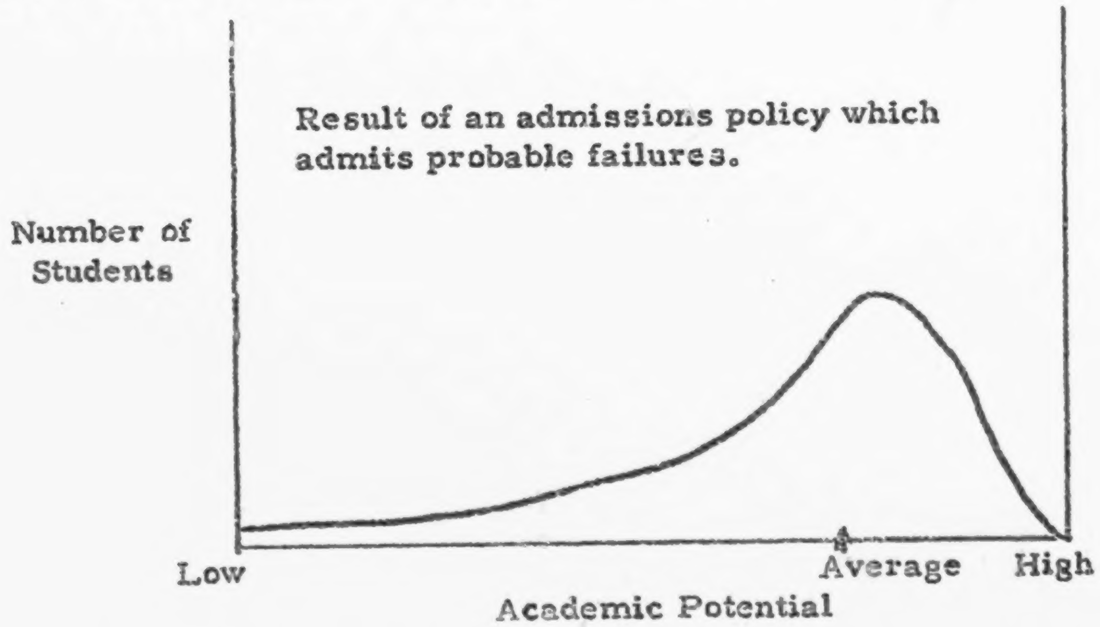

Figure 1

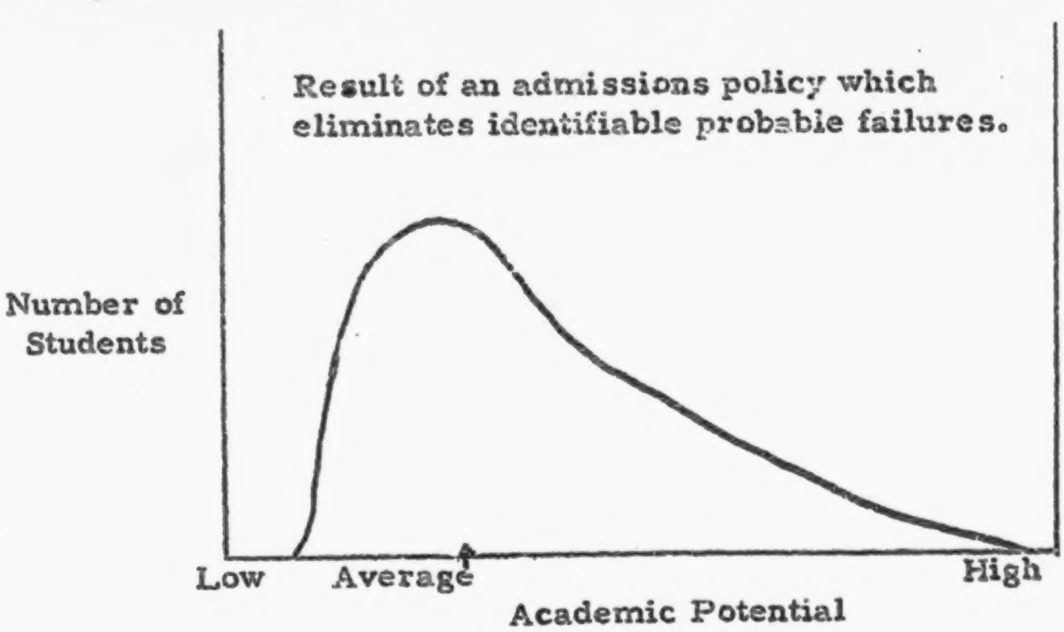

Figure 2

Another important consideration, though not completely independent of the preceeding one is whether students who are in the bottom 5 or 10% in GPA are actually likely to meet graduation requirements, a major requirement being a GPA of 2.00. If a class of more or less equally able freshmen were enrolled it is possible that not one of them would have a GPA less than, say, 1.90, and the bottom 10% would be there not because they were "destined" to be there as a result of general academic weakness, but because of specific situational and unpredictable factors such as physical illness, love affairs, over indulgence in extra-curricular activities, loss of academic interest, unsatisfactory study conditions, too much part-time employment, and others.

Table 1 also shows that approximately 50% of the Michigan freshmen had an HSPR of 86 or lower, 50% had an ACE-Total score of 118 or lower, and 50% had an SAT-Total score of 99 or lower. Since the HSPR and test variables are most useful in assessing student quality and in comparing Michigan students with others, attention is focused upon them rather than GPA. GPA is less useful because institutions enrolling superior students, according to external criteria such as tested aptitude and HSPR tend to have the same overall GPA distribution as institutions enrolling inferior students. According to the admissions officers and registrars of over 300 institutions typically about 25% of the freshmen receive unsatisfactory grades (i.e., GPA's equivalent to less than 2.00). For example the percentage of freshmen receiving unsatisfactory grades at California Institute of Technology, Dartmouth, and Harvard is 11 - 20; the same percentage of Arizona State College, Casper Junior College, and Villanova freshmen receive unsatisfactory grades. At Amherst, MIT, and Swarthmore the percentage unsatisfactory is 21 - 30; the same percentage is found at Austin Peay State College, Beaver College, and the University of Kentucky. This provides confirmation of the view that it is probably not correct to describe an individual student as "a B student," or "a C plus student," and so on. A freshman with a C+ average at a particular institution might very well have earned an A average at another institution where somewhat inferior students are enrolled or a D average at another institution where somewhat superior students are enrolled. A much more accurate description of an individual student would be "he's a Harvard B," or "he's an Indiana B," or "he's a Bay City B," etc.

The data also support the point that there seem to be no absolute standards of satisfactory performance. For example an examination paper written in a particular course at a particular institution might be evaluated by the instructor as being of C (or satisfactory) quality; the same paper evaluated by an instructor from a different institution accustomed to examination papers written by inferior students might evaluate it as being of A (or excellent) quality; but the same paper evaluated by an instructor from another institution accustomed to examination papers by superior students might evaluate it as being of D or E (or unsatisfactory) quality.

The average (median) high school graduate in each high school has an HSPR of 50 (by definition) and about 4% of the University of Michigan's freshmen have an HSPR equal to or lower than 50. While the typical high school graduating class has 10% of its students with HSPR's of 90 and above (by definition) the University has about four times as many with HSPR's of 90 and above. About 50% of the freshmen have HSPR's of 86 or higher.[7] With the possible exception of the University of California it appears that no major state supported institution in this country enrolls freshmen whose high school achievement record is superior to that of freshmen enrolled at the University of Michigan. According to information supplied by Vice President Little of the University of Wisconsin the median HSPR of their 1956-57 freshmen was 78. 29% of the University of Wisconsin's freshmen have HSPR's of 90 or higher. Wisconsin, unlike California and Michigan, does not disqualify applicants by means of a "qualitative" criterion; according to the University's catalog all Wisconsin high school graduates are admissible if they pass a certain pattern of high school courses. As indicated previously California requires at least a B average for admission. Michigan does not indicate in its catalog a minimum qualitative requirement for admission but in practice any resident applicant from an accredited high school with an HSPR of 75 or better, the required pattern of high school courses, and the principal's recommendation is routinely admitted by a clerical procedure.

Table 2 presents approximately equivalent scores on several different aptitude tests. They are "equivalent" mainly with respect to the percentage of students throughout the country who obtain specified scores and not necessarily with respect to the similarity of their content or to their predictive or concurrent validities. While approximately the same number of students obtain a total score of 134 on the ACE as obtain a total score of 122 on the SAT, [illegible] the college grades these students are likely to earn will be the same, actually a student with a SAT of 122 is somewhat more likely to do well academically than a student with an ACE of 134 because the SAT (being, among other things, about three times as long as the ACE) is generally considered to be more valid than the ACE.

[illegible] average [illegible] college [illegible] throughout the nation has [illegible] score of about 105 [illegible] the National ACE Norm Group[11] [illegible]

It is important to state that 50% of the freshmen for whom it was possible to obtain HSPR's had HSPR's of 86 or higher. It was not possible to obtain HSPR's for about 1.9% of the 2326 freshmen despite a special request made to the high schools by the Office of Admissions. (The request was made after the fall semester had begun. It did produce several hundred for whom HSPR information previously was unavailable.) While the number for whom HSPR information is unavailable is small, it is probable that many had low HSPR's.

[11] The "National ACE Norm Group" is composed of a heterogeneous group of institutions having in it very few of the better colleges. Of the 329 institutions in the norm group for the 1949 edition of the ACE the name of every fifth one is listed below to characterize the norm group.

1. Four-Year Colleges
   - Alabama College
   - Brenau College
   - College of New Rochelle
   - Elon College
   - Illinois College
   - Marion College
   - Mount St. Mary's College
   - Rosary College
   - Siena College
   - Washington College
2. Teachers Colleges
   - Central Michigan College of Education
   - Shepherd State College
3. Junior Colleges
   - Freeman Junior College
   - Mount St. Clare Junior College
   - Shorter College
4. Others
   - Manor College

Table 2

Approximately Equivalent Aptitude Test Scores*

IQ	National ACE-PR	ACE (1949 Edition)			SAT				SQT		
		Tot.	Ling	Quant	PR	Tot.	Verb	Math	Tot.	Verb	Quant
a	b	c	d	e	f	g	h	i	j	k	l
					99	139	725	725	103	54	54
		168	108	66	98	135	700	700	99	52	52
	99	158	102	62	96	131	675	675	95	49	50
	96	147	96	58	93	126	650	650	90	46	47
	90	136	87	52	89	122	625	625	86	44	45
130	87	133	84	51	84	117	600	600	81	42	42
	85	130	82	50	77	113	575	575	77	39	40
	83	128	80	49	69	109	550	550	73	36	37
	80	125	79	48	60	104	525	525	68	34	35
125	70	117	73	45	50	100	500	500	64	32	32
	65	114	70	44	40	96	475	475	60	29	30
	60	111	68	43	31	91	450	450	55	26	27
	56	108	66	42	23	87	425	425	51	24	24
115	50	105	64	40	16	83	400	400	47	22	22
	46	102	62	39	11	78	375	375	43	19	19
[illegible]	40	98	60	38	7	74	350	350	39	16	[illegible]
104	30	91	55	35	4	69	325	325	34	14	14
	20	83	50	31	2	65	300	300	29	12	12
100	16	79	47	29	1	61	275	275	25	10	10
	13	75	45	27	0	56	250	250			
	10	71	42	25							

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* The data in columns a, b, and h are taken from John Dobbin The admissions officer as a consumer of guidance College Board Review No 26, Spring, 1955, 18-24.

of Michigan's freshmen obtained an ACE of 105 or lower; this can be seen from Table 1 which gives the norms for the University of Michigan's freshmen. An ACE of 105 is roughly equivalent to an IQ of 115 (columns a and c).

The average high school graduate in the country has an IQ of about 108. An IQ of 108 is roughly equivalent to an ACE of 98 and about 12% of the University's freshmen have scores this low or lower. The average (median) University of Michigan freshman has an ACE of 118 which is equivalent to an IQ of about 125.[11] Scores equal to or higher than these are obtained by about 30% of the students enrolled in the "National ACE Norm Group," and by about 50% of the applicants in the "SAT Norm Group " (i.e., about 30% of the students in the ACE Norm Group and 50% of the applicants in the SAT Norm Group score higher than the average freshman at Michigan).

The composition of the norm group for the SAT of the College Board is not known very precisely. According to Henry Dyer, formerly Associate Director of the Board, the norm group "was made up by taking from the Board's files the names of all final candidates--i.e., twelfth grade students--who had taken the Scholastic Aptitude Test in April 1941."[12] The SAT scores of these applicants for admission to College Board colleges were manipulated and transformed in such a way as to give the average applicant a score of 500 on the Verbal and Mathematical subtests. The applicant with a score equal to or higher than 16% of the applicants was assigned a score of 400 and the applicant with a score equal to or higher than 84% of the applicants was assigned a score of 600. (The SAT-PR's in Table 2 show this.) It is interesting to see that the freshmen enrolled at Michigan have scores almost identical with those obtained by the applicants in the SAT norm group. (See Table 1).[13]

Table 3 presents the SAT scores (Verbal and Mathematical) as reported by the admissions officers of some of the larger College Board institutions. Each institution's admissions officer was asked to indicate on a questionnaire "(a) the SAT score below which can be found the scores of about 50% of the entering freshmen, (b) the SAT score below which can be found the scores of about 85% of the freshmen, and (c) the scores below which can be found the scores of about 15% of the freshmen." In terms of tested aptitude it is apparent that these institutions enroll rather superior freshmen. Although each institution's freshmen are not uniformly able the difference in scores between the 85% value and the 15% value is not especially great (but greater homogeneity would be desirable). It would appear that only a small percentage of the enrolled freshmen have scores below 500. Since the average

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[11] About 4.7% of the entire population obtain IQ's of 125 or higher.

[12] Dyer, Henry S. College Board Scores: Their Use and Interpretation. New York: College Entrance Examination Board, Not dated, but about 1953.

[13] It is important to point out, however, that not all Michigan freshmen took the SAT. Of the 2926 freshmen 93 or 3.2% did not take the SAT when it was given for experimental purposes during the Fall 1955 Orientation Program. Since the median ACE of these students is 111.3 and the median HSPR is 79.3, both considerably below the University's average, it is likely that the SAT scores of all Michigan freshmen would be somewhat lower than the scores in Table 1 indicate.

College Board applicant has an SAT of about 500 it seems reasonable to infer that an institution willing to accept students at this level or lower will be able to expand its enrollment rather easily. (Data from many other large institutions have been received but are not presented in Table 3 because the admissions officers who participated in the study from which this material has been taken checked one of the following two alternatives: "(c) These data have not been released before, so do not cite specific information without obtaining special and additional permission. (d) These data should not be released to admissions officers or anyone else under any foreseeable circumstances." Since a large majority checked (c) it is probable that the information could be made available if there is sufficient local interest or need. While it is true that in general the scores of freshmen enrolled in these institutions (e.g., Hofstra, Notre Dame, and Villanova) are below those given in Table 3, two of the institutions with the highest scores asked that theirs be kept confidential.)

Table 3

Scholastic Aptitude Test Scores of Freshmen Enrolled in Selected Large College Board Institutions

	SAT-Verbal			SAT-Mathematical		
Institution	15%	50%	85%	15%	50%	85%
Brandeis	530	590	640	500	570	630
Columbia	480	580	600	470	570	590
Carnegie IT	460	540	640	530	620	675
Dartmouth	480	570	640	520	600	700
Fordham	450	550	600	450	500	550
Harvard	550	640	700	500	650	725
Massachusetts IT	520	610	700	630	700	750
Princeton	520	600	700	510	630	750
Rensselaer PI	450	550	640	560	630	725
Yale	520	610	700	550	650	750

All institutions in Table 3 practice "selective or competitive admissions" and are privately supported. Relatively few state-supported institutions use the SAT in screening applicants at the present time but a considerable number are planning to do so. For example Herman Spindt, Director of Admissions at California (Berkeley) indicated on his questionnaire that California "will probably require CEEB SAT beginning in 1959." The 15 colleges in the University System of Georgia began requiring the SAT of all its applicants in 1957.

Table 3 permits several kinds of comparisons between Michigan freshmen (Table 1) and freshmen in the institutions requiring the SAT for admission. It shows for example, that only a very small percentage (say about 5%) of the freshmen at Harvard, MIT, Princeton, and Yale have SAT scores below the average freshmen at Michigan. In terms of IQ's this means that about 5% of the former institutions freshmen have IQ's below 125 but about 50% of Michigan's have such IQ's.

Most of the preceeding was intended to provide a frame of reference for evaluating the quality of freshmen at the University of Michigan in relation to freshmen at other institutions. The remainder of this report is concerned almost entirely with the academic quality (as defined by tested aptitude and HSPR) and college achievement (GPA and course grades) of Michigan freshmen.

Tables 4a and 4b show the relation between GPA and HSPR, and GPA and ACE for all fresh men in the University. Freshmen from each school and college have been thrown together; the effect of this is to lower relationships (e.g., students of a certain quality in one unit receive lower grades than students of the same quality in another unit). Separate data for each of the 9 University units admitting freshmen are given later on.

It is to be noted that the GPA distribution for all freshmen has been divided into eight intervals of half a grade-point each, and the HSPR and ACE distributions have been divided into approximate fifths. (Table 1 presents the complete distributions for these variables.) Certain irregularities or lumping in the HSPR and ACE distributions made it impossible to place exactly 20% in each fifth. For example, if all those having an HSPR of 95 had been placed in the highest fifth then this top fifth would have had much more than 20% of all the HSPR's. An attempt was made to have similar numbers in corresponding fifths on HSPR and ACE (e.g., 16.7% were placed in the top fifth on both, and 20.0% and 19.9% were placed in the bottom fifth on HSPR and ACE respectively).

On the bottom of both tables can be found the median GPA for each fifth, for example in Table 4a the median GPA of freshmen in the top fifth on HSPR is 3.02, and the median GPA of freshmen in the bottom fifth is 2.07.

On the right of Table 4a can be found the median HSPR for students at each GPA interval; for example the median HSPR of the students who obtained a GPA of 3.50 to 4.00 is 95.5. On the right of Table 4b can be found the median ACE for students at each GPA interval; for example the median ACE of the students who obtained a GPA of 3.50 to 4.00 is 137.9.

The median GPA for the 2926 freshmen given in Table 4a is 2.37. Reference to Table 1, however, shows that the GPA equivalent to a percentile rank (PR) of 50 (the median) is 2.28 to 2.30. The slight discrepancy or "error" is due to the grouping of GPA's into intervals in Table 4a and an assumption which is made in computing a median from "grouped data." The assumption is that the values (GPA's in this case) are distributed equally over each interval; since most of the GPA's in the interval containing the median (i.e., 2.00 to 2.49) are either 2.00 or 2.27, and obviously not spread equally over the interval a slight error in medians is introduced. Somewhat similar errors are introduced in the medians for HSPR and the ACE.

University Number of Students: 2926

Table 4a

GPA According to HSPR

GPA	N	%	No HSPR	HSPR Fifth 1 00-70	2 71-82	3 83-89	4 90-95	5 96-99	Med HSPR
3.5-4.00	189	6.5	5	7	13	23	48	93	95.5
3.0-3.49	436	14.9	5	37	52	77	113	115	92.1
2.5-2.99	579	19.8	5	76	93	133	160	112	88.7
2.0-2.49	865	29.2	12	193	203	178	180	89	83.5
1.5-1.99	392	13.4	6	114	116	74	66	16	78.7
1.0-1.49	272	9.3	2	92	82	53	32	11	76.8
.5-.99	77	2.6	3	36	19	12	6	1	71.4
.0-.49	29	1.0	0	14	5	4	4	2	71.7
No GPA	98	3.3	18	16	19	19	13	13	84.3
N	2926		56	585	602	573	622	488	85.5
%			1.9	20.0	20.6	19.6	21.2	16.7	
Med GPA	2.37		2.33	2.07	2.15	2.37	2.55	3.02	

Table 4b

GPA According to ACE

GPA	No ACE	ACE Fifth 1 000-102	2 103-113	3 114-124	4 125-138	5 139-190	Med ACE
3.5-4.00	2	3	14	24	55	91	137.9
3.0-3.49	9	23	56	76	121	150	131.2
2.5-2.99	3	78	101	133	163	101	122.3
2.0-2.49	9	184	188	214	174	85	116.1
1.5-1.99	14	103	82	98	61	36	114.2
1.0-1.49	5	107	60	54	33	13	107.4
.5-.99	1	37	16	14	8	1	103.2
.0-.49	2	14	3	3	6	1	98.8
No GPA	9	35	16	13	11	12	105.3
N	54	582	539	629	632	490	119.0
%	1.8	19.9	18.4	21.5	21.6	16.7	
Med GPA	0.98	2.03	2.26	2.32	2.58	3.00	

Median GPA-RS = 2.37 Median HSPR-RS= 85.5 Median ACE-RS= 119.0

University

Median GPA-PR= 52 Median HSPR-PR= 48 Median ACE-PR= 52

Practically all of the "group" medians given in Tables 4a and 4b and subsequently are "off" a little.[14] Reference to Table 1 shows that a GPA of 2.37 is equivalent to a PR of 52, an HSPR of 85.5 is equivalent to a PR of 48, and an ACE of 119.0 is equivalent to a PR of 52. A GPA of 2.29, an HSPR of 86.5 and an ACE of 118.3 would each have been equivalent to a PR of 50 so it can be seen that the "error" is not great. The substance of Tables 4a and 4b could be summarized by saying that there is a relationship between GPA and HSPR, and GPA and ACE; all students are not equally qualified and do not have an equal opportunity for a GPA of 3.50 to 4.00 or for a GPA of .00 to 1.49.

Of the 488 in the top fifth on HSPR 93 obtained a GPA of 3.50 to 4.00, but of the 586 in the bottom fifth on HSPR only 7 obtained such a high GPA only 14 in the top fifth on HSPR obtained a GPA less than 1.50, but 142 in the bottom fifth obtained such a low GPA.

Of the 590 in the top fifth on ACE 91 obtained a GPA of 3.50 to 4.00, but of the 582 in the bottom fifth only 3 obtained such a high GPA; only 15 in the top fifth on ACE obtained a GPA less than 1.50, but 158 in the bottom fifth obtained such a low GPA There is a somewhat stronger relationship between ACE and GPA than between HSPR and GPA, but for all practical purposes the validity of the ACE and HSPR can be considered identical for the Michigan freshmen of 1955.

It is clear from the preceeding paragraphs that not only are there weak students enrolled as the faculty contends, but it is possible to specify fairly well who many of them are before the fall semester begins. Nevertheless 44 in the lowest fifth on HSPR obtained GPA's of 3.00 and higher (high enough so if maintained would permit the student to undertake graduate work) and many not in the lowest fifth obtained GPA's less than 1.50 (low enough so graduation with a Bachelor's degree is not assured). Similarly 26 in the lowest fifth on ACE obtained GPA's of 3.00 and higher, and many not in the lowest fifth obtained GPA's less than 1.50

It is of course probable that some students in the lowest fifth on HSPR had very high tested aptitude and that is why they earned superior GPA's and that some in the lowest fifth on ACE had very high HSPR's and that is why they earned superior GPA's. But before considering this aspect further some additional data relating another aptitude test to GPA will be given.

Table 4c presents comparable data for the relation between GPA and the College Board's SAT. The SAT scores are obtained by adding each students SAT-Verbal and SAT-Mathematical scores and dropping the last digit. It is important to note that the relationship between SAT and GPA is more marked than the relationship between ACE and GPA. As mentioned earlier the SAT is a longer aptitude test than the ACE (the SAT is a three-hour test, the ACE is a one-hour test) and provides a more valid assessment of the academic promise of a student than the ACE. But since SAT scores were unavailable for 93 students, as compared with 54 omissions for the ACE, the SAT has not been used for subsequent analyses. It is safe to say,

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[14] While it would have been preferable to have conducted this phase of the investigation with "ungrouped" data, the task would have been difficult and time consuming to the point of being prohibitive.

University

Number of Students: 2926

Table 4c

GPA According to SAT

GPA	N	%	No SAT	SAT Fifth					Med SAT
				1	2	3	4	5	
				58-84	85-94	95-103	104-114	115-149	
3.5-4.00	189	6.5	1	4	7	16	41	120	122.1
3.0-3.49	435	14.9	9	16	36	62	133	179	111.7
2.5-2.99	579	19.8	15	51	119	122	147	125	102.8
2.0-2.49	855	29.2	21	170	209	209	155	91	96.1
1.5-1.99	391	13.4	16	117	95	76	60	27	91.9
1.0-1.49	272	9.3	14	121	65	34	28	10	85.7
.5-.99	78	2.7	3	35	20	11	6	3	85.8
.0-.49	29	1.0	2	14	6	3	3	1	83.5
No GPA	98	3.4	12	32	20	12	16	6	90.0
N	2926		93	560	577	545	589	562	99.1
%			3.2	19.1	19.7	18.6	20.1	19.2	
Med GPA	2.37		2.13	1.90	2.22	2.34	2.61	3.05	

University

Median GPA-RS= 2.37 Median SAT-RS= 99.1

Median GPA-PR= 52 Median SAT-PR= 49

however, that relationships and differences to be discussed (or presented without discussion) would be greater if the SAT rather than the ACE had been used.

Since it is possible that students having a low HSPR qualified for admission to the University by virtue of high tested aptitude, and that students having low tested aptitude qualified for admission by having a high HSPR the relation between HSPR and ACE is of interest. One expectation would be that few if any students would be in the bottom fifth on both HSPR and ACE.

Table 5 presents the number of students falling into various fifths on HSPR and ACE. It is apparent that a considerable number of freshmen are in the bottom fifths on both HSPR and ACE. While there are some in the bottom fifth on one and in the top fifth on the other the tendency is for freshmen to be low on both or high on both. The 146 freshmen in the bottom fifth on both could be described with some accuracy as average high school graduates. As a group their tested aptitude is slightly below the average graduating high school senior but their high school achievement is somewhat above the average (i.e., median IQ about 106 (median ACE = 94) and median HSPR about 62). Since these freshmen are for all practical, or, more accurately, academic, purposes merely average high school seniors, it is not surprising to find that as a group they perform rather poorly as college freshmen at the University of Michigan. It would seem that these students qualified for admission to the University on bases other than academic fitness (e.g., strong social or extra-curricular records, unfluential parents, and so on). While they may merit a college education at the taxpayers expense perhaps it would be best [illegible] they were educated at an institution with a program more appropriate to their ability. It is also quite possible that a faculty less scholarly than the University's could do a better job of "reaching" this kind of academically weak student.

Although the 146 freshmen make up only 5.2% of the 2826 freshmen having both HSPR and ACE information the number is substantial enough to be of considerable concern to the University. It does not take many weak students to lower academic standards and produce unnecessary problems for a busy and scholarly faculty.

These "very weak" students can be matched by an approximately equal number of "very strong" students; 142 or 5.0% of the 2826 freshmen might be so labelled.[15] These "top fifths" freshmen ranked in the top 3% of their high school graduating class and have IQ's above 132. (The University needs more of them!) It would appear that with the possible exception of California Institute of Technology no educational institution now enrolls a freshman class superior to this group of "very strong" students.

Probably more students than just those in the extreme fifths merit a label. Perhaps those in the bottom two fifths on both HSPR and ACE could justifiably be considered to be "inferior," and those in the top two fifths "superior." It is to be noted that the "very weak" and "very strong" students are also included in the "inferior" and "superior" groups respectively. According to Table 5,545 or 19.3%

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[15] Academically, freshmen in the top fifth on both HSPR and ACE are stronger than freshmen selected for the LSA honors program initiated in the Fall of 1957.

Table 5

Students in Various Fifths on HSPR and ACE*

ACE / HSPR		No ACE	ACE Fifth 1 60-102	2 103-113	3 114-124	4 125-138	5 139-190	N
HSPR Fifth 5	96-99	5	38	68	102	133	142	488
4	90-95	9	101	96	145	155	116	622
3	83-89	4	128	116	113	123	86	573
2	71-82	9	150	143	124	114	62	602
1	00-70	17	146	106	139	103	74	585
No HSPR		10	18	7	6	4	11	56
N		54	582	536	629	632	490	2926

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*Of the 2926 freshmen, 100 or 3.4% did not have an HSPR, or ACE, or both. All subsequent tables using combinations of HSPR and ACE do not include these 100 freshmen. Quality-wise they are somewhat below average and the median GPA of the 75 of them who obtained first semester GPA's is also somewhat below average (2.17). Of the 45 having neither HSPR or ACE (10 students), or no information on one of them and in the bottom fifth on the other (35 students), only 32 obtained GPA's; the median GPA of these 32 freshmen is 1.94. (In general while no news may be good news, no objective assessment information is bad news.)

of the 2826 freshmen would be "inferior," their median HSPR is about 72 and their median ACE is about 101 (an IQ of about 111): as a group these freshmen are slightly above the average high school graduating senior, and somewhat below the average college freshmen in the colleges comprising the "National ACE Norm Group." Almost an identical number, 546 or 19.3% would be "superior," their median HSPR is about 96 and their median ACE is about 136 (equivalent to an IQ of about 131). Qualitywise this group of "superior" freshmen would be about equal to the freshmen enrolled at Harvard, MIT, Princeton, and Yale.

To summarize, roughly 5% of the University's freshmen have been labelled "very weak," 5% "very strong," 20% "inferior," and 20% "superior" according to their high school achievement and tested aptitude. It is important to stress, however, that these groups do not necessarily contain the most and least able 5% and 20% of the freshmen according to HSPR and ACE. They were drawn by fifths, for convenience of analysis and discussion, from among the most and least able freshmen (possibly from among the extreme 6% and 25%). For example a student with an HSPR higher than 21% of the freshmen and an ACE higher than only 1% of the freshmen is not included in the "very weak" group because he is not in the bottom fifth on both; but academically such a student is weaker than the student who has an HSPR higher than 19% of the freshmen and an ACE higher than 19% (and therefore in the bottom fifth on both). Similarly a student with an HSPR higher than 98% of the freshmen and an ACE higher than 79% would not be in the "top fifth on both" and consequently not considered "very strong" even though he is, in terms of academic promise, stronger than some in the "very strong" group. If the two percentages (98 and 79) were averaged this student would prove to be near the average of the students in the "very strong" group.

Subsequent tables for the various University units and freshman courses show where the talented and untalented freshmen (according to fifths) are to be found. The ratio of "very weak" to "very strong" students, and the ratio of "inferior" to "superior" students permits each unit and department to see whether it is getting its share of the academic talent entering the University as freshmen. If the ratio is about 1:1 then "a fair share" is being enrolled. A major departure from a ratio of 1:1 probably indicates something of some consequence. But in some areas or specialties superior academic quality may not be necessary or desirable (For example a satisfactory Dental Hygienist probably must have a certain amount of a number of traits, too much as well as too little academic ability may prove to be detrimental to success). The optimum ability level for each occupational group is not the highest ability level.

Table 6 shows the academic performance of the extreme groups of freshmen as well as that of the total group[16] and freshmen having other combinations of HSPR and ACE.

Perhaps of major interest are the GPA's of the 138 "very strong" and the 141 "very weak" freshmen. While 26.9% of the 2753 freshmen obtained GPA's less than

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[16] Of the 2826 freshmen having both HSPR and ACE 2753 obtained first semester GPA's, and 73 did not. The median HSPR of the 73 is 84.9 (PR = 47), and the median ACE is 109.7 (PR = 32).

University Number of Students: 2753

Table 5

GPA According to Certain Combinations of HSPR and ACE

Group		GPA 1 0-.49	2 .50-.99	3 1.0-1.49	4 1.5-1.99	5 2.0-2.49	6 2.5-2.99	7 3.0-3.49	8 3.5-4.0	N	Med GPA-RS	Med GPA-PR
All Freshmen Having Both HSPR and ACE	N	27	73	265	374	837	571	424	182	2753	2.38	52
	%	1.0	2.7	9.6	13.6	30.4	20.7	15.4	6.6			
Top 1/5 on Both HSPR and ACE	N				3	13	25	57	40	138	3.24	87
	%				2.2	9.4	18.1	41.3	29.0			
Bottom 1/5 on Both HSPR and ACE	N	6	12	29	35	51	7	1		141	1.83	24
	%	4.3	8.5	20.6	24.8	36.2	5.0	.7				
Middle 1/5 on Both HSPR and ACE	N		1	9	16	35	32	12	5	110	2.41	53
	%		.9	8.2	14.5	31.8	29.1	10.9	4.5			
Top 1/5 on HSPR and Bottom 1/5 on ACE	N		1	4	3	9	15	4		36	2.53	61
	%		2.8	11.1	8.3	25.0	41.7	11.1				
Bottom 1/5 on HSPR and Top 1/5 on ACE	N		1	7	8	20	20	13	4	73	2.51	58
	%		1.4	9.6	11.0	27.4	27.4	17.8	5.5			
Top 2/5 on Both	N	3	1	7	24	91	135	163	111	535	3.01	82
	%	.6	.2	1.3	4.5	17.0	25.2	30.5	20.7			
Bottom 2/5 on Both	N	10	37	103	107	196	57	15	2	527	2.01	36
	%	1.9	7.0	19.5	20.3	37.2	10.8	2.8	.4			

2.00 only 2.2% of the ''very strong'' group earned less than a 2.00 but a majority, 58.2% of the ''very weak'' group received unsatisfactory GPA's. In other words the typical freshman in the top fifth on both HSPR and ACE is expected to do satisfactory work (i.e., a GPA of 2.00 or better)[17] but the typical freshman in the bottom fifth on both is expected to do unsatisfactory work.

It is true of course that not all achieve what is expected of them, some do better and some do worse. It is possible that the 3 ''very strong'' freshmen who earned less than a 2.00 struggled with a heavy non-academic work load, or had undesirable roommates, or were unchallenged in courses taken with many weak students, or took difficult and demanding courses, or for some other reason did not obtain GPA's commensurate with their potential. No attempt in this investigation was made to determine why these and other ''atypical'' freshmen performed the way they did. It is possible, though improbable, that these atypical performing top fifth students are really mediocre but were lucky, etc., both in high school and on the test.

It is conceivable that many of the ''very weak'' freshmen who obtained a satisfactory GPA did so by concentrated study and ''burning the midnight oil,'' or by plaguing the faculty with questions and demands for personal attention, or by enrolling in what students refer to as ''snap'' or ''pie'' courses and programs,[18] or by some other means. It is possible, though improbable, that many of the students who were labelled ''very weak'' were incorrectly described by their bottom fifths status; but even so only 5.7% of the 141 students obtained a GPA of 2.50 or better, and only 1 freshman obtained a GPA above 2.99.

No attempt was made in this investigation to determine why these and other ''atypical performing'' freshmen performed the way they did. But an examination of the courses taken by them disclosed the fact that students who obtained lower GPA's than expected from their fifth status tended to be enrolled in what might be called ''stiff grading'' courses and students who obtained higher GPA's than would be expected tended to be enrolled in ''liberal grading'' courses. (Data presented in Table 13 and elsewhere in this report bear on this aspect more directly)

While the difference between the median performance of the ''very weak'' and ''very strong'' groups is quite marked (almost 1-1/2 letter grades and the GPA's of two-thirds of the freshmen separate them) the difference between the performance of the ''inferior'' and ''superior'' groups is also considerable (1 letter grade and the GPA's of about half the freshmen separate them). Only 6.6% of the ''superior'' freshmen obtained less than a GPA of 2.00 but 48.7% of the ''inferior'' freshmen obtained unsatisfactory GPA's.

Although 606 or 22.0% of the 2753 freshmen obtained GPA's above 2.99, 274 or 51.2% of the ''superior'' group and 17 or 3.2% of the ''inferior'' group obtained such GPA's.

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[17] Actually since 70.3% of this group obtained GPA's of 3.00 and above the typical freshmen in the top fifth on both is expected to perform at a level high enough so if maintained would qualify him for graduate work.

[18] Rumor has it that some fraternities and sororities and other residence units have in them student ''advisers'' who boast that they can outline a course of study such that anyone who follows it can obtain a satisfactory GPA.

Looking at it from another angle it can be seen that 45.2% (274 of 606) of the highest GPA's are achieved by a certain fifth (i.e., top two fifths on both) of the freshman class but only 2.8% (17 of 606) of these GPA's are achieved by a certain other fifth of the class. In other words the chances of a student in the top fifth obtaining a GPA above 2.99 are about 16 times as great as the chances of a student in the bottom fifth.

The other end of the GPA distribution is also of interest in this connection. Of the 2753 freshmen 365 or 13.3% obtained GPA's below 1.50, low enough so that graduation at Michigan is unlikely for almost all of them.[19] Only 11 or 2.1% of the "superior" freshmen obtained a GPA below 1.50 but 150 or 28.4% of the "inferior" freshmen obtained such a low GPA. More importantly only 3.0% (11 of 365) of these lowest GPA's are obtained by a certain fifth of the freshman class but 41.1% (150 of 365) of the lowest grades are obtained by a certain other fifth. In other words the chances of a student in the top fifth obtaining a GPA below 1.50 are about one fourteenth as great as the chances of a student in the bottom fifth.

It is clear from this that not all entering freshmen have an equal opportunity for success (or failure). And it is obvious that the University would have lost few students who obtained outstanding University records if the bottom fifth had not been enrolled. If in their place another fifth comparable to the top fifth had been enrolled relatively few of them would have been found unsatisfactory by the faculty.

Before presenting tables comparable to Tables 5 and 6 for each of the nine University units admitting freshmen, additional items contained in Table 6 should be noted. One is that average or somewhat above average GPA's are achieved by freshmen who are in the bottom fifth on one variable (HSPR or ACE) and in the top fifth on the other variable. Compensation does take place apparently. And, as is to be expected, freshmen who are in the middle fifth on both (the more or less hypothetical average freshmen) achieve average grades.

The tables on pages 23 to 40 are presented without detailed comment. But in passing it can be said that the academic performance of the extreme groups is quite different for each of the units. In some units the differences are greater than those for the University as a whole, in others they are less. Another important point is that there seems to be no strong relation between the academic quality of freshmen (as defined by HSPR and ACE) in the units and the grades they are given. For example the unit with the most able freshmen (Engineering School) is not the unit with the highest average GPA's, and the unit with the highest average GPA (Music School) is not the unit with the most able freshmen.[20]

Table 7 on page 41 presents each unit's median GPA-PR along with its median PR's on HSPR and ACE. One rough composite measure of "student quality" might be the

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[19] It will be interesting to find how many of these "less than 1.50 first semester freshmen" graduate in 1959. Of the 238 LSA freshmen with less than 1.50 only 46 or 19.3%received Fall 1957-58 semester grades. (See Supplement A)

[20] It appears that it would be incorrect to describe a student as a "Michigan B;" a more accurate description would be "he's a Michigan LSA B," etc.

College of Architecture and Design Number of Students: 103

GPA According to HSPR

GPA	N	%	No HSPR	HSPR Fifth					Med HSPR
				1	2	3	4	5	
				00-70	71-82	83-89	90-95	96-99	
3.5-4.00	3	2.9		1		1		1	86.0
3.0-3.49	13	12.6		1	1	2	5	4	92.5
2.5-2.99	18	17.5	1	3	4	6	1	3	84.3
2.0-2.49	27	26.2	1	3	9	9	5		83.3
1.5-1.99	24	23.3		5	13	3	3		77.0
1.0-1.49	8	7.8		3	3		1	1	74.5
.5-.99	4	3.9		1	3				--
.0-.49	1	1.0		1					--
No GPA	5	4.9			3		1	1	--
N	103		2	18	36	21	16	10	81.3
%			1.9	17.5	35.0	20.4	15.5	9.7	
Med GPA	2.22			1.90	1.90	2.41	2.35	3.06	

GPA According to ACE

GPA	No ACE	ACE Fifth					Med ACE
		1	2	3	4	5	
		000-102	103-113	114-124	125-138	139-190	
3.5-4.00					1	2	159.5
3.0-3.49		2	2	1	4	4	129.8
2.5-2.99		3	2	7	4	2	119.8
2.0-2.49	1	7	8	5	2	4	110.8
1.5-1.99	2	5	5	5	4	3	115.7
1.0-1.49		2	3	1	1	1	109.8
.5-.99		1		1	2		--
.0-.49					1		--
No GPA		2	3				--
N	3	22	23	20	19	16	116.3
%	2.9	21.4	22.3	19.4	18.4	15.5	
Med GPA		2.14	2.12	2.30	2.38	2.50	

Arch. & Design

Median GPA-RS= 2.22
Median GPA-PR= 42

Median HSPR-RS= 81.3
Median HSPR-PR= 37

Median ACE-RS= 116.3
Median ACE-PR= 45

Architec ture and Design　　Number of Students: 93

GPA According to Certain Combinations of HSPR and ACE

Group		GPA 1	2	3	4	5	6	7	8	N	Med GPA-RS	Med GPA-PR
		.0-.49	.5-.99	1.0-1.49	1.5-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0			
All Freshmen Having Both HSPR and ACE	N	1	3	8	22	26	17	13	3	93	2.24	42
	%	1.1	3.2	8.6	23.7	28.0	18.3	14.0	3.2			
Top 1/5 on Both HSPR and ACE	N						1	2	1	4	--	--
	%											
Bottom 1/5 on Both HSPR and ACE	N		1	1	1			1		4	--	--
	%											
Middle 1/5 on Both HSPR and ACE	N				1		3			4	--	--
	%											
Top 1/5 on HSPR and Bottom 1/5 on ACE	N									0	--	--
	%											
Bottom 1/5 on HSPR and Top 1/5 on ACE	N			1		1			1	3	--	--
	%											
Top 2/5 on Both	N					3	3	6	1	13	3.04	82
	%					23.1	23.1	46.2	7.7			
Botton 2/5 on Both	N		1	4	8	7	2	2		24	1.93	26
	%		4.2	10.7	33.3	29.2	8.3	8.3				

Dental/Hygiene Curriculum Number of Students: 17

GPA According to HSPR

GPA	N	%	No HSPR	HSPR Fifth 1	2	3	4	5	Med HSPR
				00-70	71-82	83-89	90-95	96-99	
3.5-4.00	1		1						--
3.0-3.49	1							1	--
2.5-2.99	2					1	1		--
2.0-2.49	5			1	3			1	--
1.5-1.99									--
1.0-1.49	1			1					--
.5-.99									--
.0-.49									--
No GPA	7		4			1		2	--
N	17		5	2	3	2	1	4	86.0
%									
Med GPA	2.40								

GPA According to ACE

GPA	No ACE	ACE Fifth 1	2	3	4	5	Med ACE
		000-102	103-113	114-124	125-138	139-190	
3.5-4.00		1					--
3.0-3.49					1		--
2.5-2.99		1		1			--
2.0-2.49		1	2	2			--
1.5-1.99							--
1.0-1.49		1					--
.5-.99							--
.0-.49							--
No GPA		2	1	2	1	1	--
N		6	3	5	2	1	111.7
%							
Med GPA							

Dental Hygiene

Median GPA-RS= 2.40 Median HSPR-RS= 86.0 Median ACE-RS= 111.7

Median GPA-PR= 53 Median HSPR-PR= 49 Median ACE-PR= 36

Dental Hygiene Curriculum Number of Students: 9

GPA According to Certain Combinations of HSPR and ACE

Group		GPA								N	Med GPA-RS	Med GPA-PR
		1	2	3	4	5	6	7	8			
		0- .49	.5- .99	1.0- 1.49	1.5- 1.99	2.0- 2.49	2.5- 2.99	3.0- 3.49	3.5- 4.0			
All Freshmen Having Both HSPR and ACE	N %			1		5	2	1		9	2.35	52
Top 1/5 on Both HSPR and ACE	N %									0		
Bottom 1/5 on Both HSPR and ACE	N %			1		1				2		
Middle 1/5 on Both HSPR and ACE	N %						1			1		
Top 1/5 on HSPR and Bottom 1/5 on ACE	N %									0		
Bottom 1/5 on HSPR and Top 1/5 on ACE	N %									0		
Top 2/5 on Both	N %							1		1		
Bottom 2/5 on Both	N %			1		3				4		

School of Education Number of Students: 41

GPA According to HSPR

GPA	N	%	No HSPR	HSPR Fifth					Med HSPR
				1	2	3	4	5	
				00-70	71-82	83-89	90-95	96-99	
3.5-4.00	1	2.4						1	--
3.0-3.49	2	4.9					1	1	--
2.5-2.99	8	19.5		2	2	1	3		82.5
2.0-2.49	10	24.3		4	3	1	2		74.5
1.5-1.99	8	19.5	1	4	2	1			61.7
1.0-1.49	10	24.3		3	3	3	1		78.5
.5-.99	1	2.4		1					--
.0-.49									
No GPA	1	2.4			1				
N	41		1	14	11	6	7	2	77.0
%			2.4	34.1	26.8	14.6	17.1	4.9	
Med GPA	2.05			1.87	2.00				

GPA According to ACE

GPA	No ACE	ACE Fifth					Med ACE
		1	2	3	4	5	
		000-102	103-113	114-124	125-138	139-190	
3.5-4.00				1			--
3.0-3.49			2				--
2.5-2.99		3		2	2	1	119.0
2.0-2.49		3	4	3			108.0
1.5-1.99	1	6	1				--
1.0-1.49	1	8	1				57.7
.5-.99	1						
.0-.49							
No GPA		1					
N	3	21	8	6	2	1	92.7
%	7.3	51.2	19.5	14.6	4.9	2.4	
Med GPA		1.66					

Education

Median GPA-RS= 2.05 Median HSPR-RS= 77.0 Median ACE-RS= 92.7

Median GPA-PR= 36 Median HSPR-PR= 27 Median ACE-PR= 7

School of Education Number of Students: 37

GPA According to Certain Combinations of HSPR and ACE

Group		GPA								N	Med GPA-RS	Med GPA-PR
		1	2	3	4	5	6	7	8			
		.0-.49	.5-.99	1.0-1.49	1.5-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0			
All Freshmen Having Both HSPR and ACE	N			9	7	10	8	2	1	37	2.12	38
	%			24.3	18.9	27.0	21.6	5.4	2.7			
Top 1/5 on Both HSPR and ACE	N									0		
	%											
Bottom 1/5 on Both HSPR and ACE	N			3	3	1	1			8	1.66	16
	%											
Middle 1/5 on Both HSPR and ACE	N					1				1		
	%											
Top 1/5 on HSPR and Bottom 1/5 on ACE	N									0		
	%											
Bottom 1/5 on HSPR and Top 1/5 on ACE	N									0		
	%											
Top 2/5 on Both	N						2			2		
	%											
Bottom 2/5 on Both	N			5	6	5	2			18	1.83	24
	%			27.8	33.3	27.8	11.1					

College of Engineering　　　Number of Students: 588

GPA According to HSPR

GPA	N	%	No HSPR	HSPR Fifth 1 00-70	2 71-82	3 83-89	4 90-95	5 96-99	Med HSPR
3.5-4.00	41	7.0		1	4	2	12	22	95.8
3.0-3.49	79	13.4	2	6	10	10	25	26	92.5
2.5-2.99	134	22.8	1	22	24	28	33	26	87.6
2.0-2.49	160	27.2	2	35	40	29	36	18	83.5
1.5-1.99	93	15.8		26	31	18	13	5	77.7
1.0-1.49	45	7.7	1	10	17	7	5	5	79.0
.5-.99	18	3.1		7	3	3	4	1	78.5
.0-.49	4	.7				1	2	1	--
No GPA	14	2.4	3	2	1	4	2	2	86.9
N	588		9	109	130	102	132	106	86.0
%			1.5	18.5	22.1	17.4	22.5	18.0	
Med GPA	2.40			2.15	2.16	2.34	2.57	2.92	

GPA According to ACE

	No ACE	ACE Fifth 1 000-102	2 103-113	3 114-124	4 125-138	5 139-190	Med ACE
3.5-4.00			5	2	13	21	139.5
3.0-3.49	1	5	12	13	18	30	131.5
2.5-2.99		15	23	26	41	29	125.5
2.0-2.49	3	20	31	43	39	24	120.5
1.5-1.99	1	14	22	29	19	8	117.3
1.0-1.49		16	10	11	7	1	109.7
.5-.99		7	5	4	2		106.9
.0-.49		2			2		--
No GPA	1	5	2	3	1	2	110.8
N	6	84	110	131	142	115	121.7
%	1.0	14.3	18.7	22.3	24.2	19.6	
Med GPA		2.01	2.27	2.23	2.51	2.90	

Median GPA-RS= 2.40　　Median HSPR-RS= 86.0　　Median ACE-RS= 121.7

Engineering

Median GPA-PR= 53　　Median HSPR-PR= 49　　Median ACE-PR= 56

College of Engineering — Number of Students: 566

GPA According to Certain Combinations of HSPR and ACE

Group		GPA 1	2	3	4	5	6	7	8	N	Med GPA-RS	Med GPA-PR
		.0- .49	.5- .99	1.0- 1.49	1.5- 1.99	2.0- 2.49	2.5- 2.99	3.0- 3.49	3.5- 4.0			
All Freshmen Having Both HSPR and ACE	N	4	18	44	92	157	133	77	41	566	2.41	53
	%	.7	3.2	7.8	16.2	27.7	23.5	13.6	7.2			
Top 1/5 on Both HSPR and ACE	N					6	11	8	9	34	3.00	80
	%					17.6	32.4	23.5	26.5			
Bottom 1/5 on Both HSPR and ACE	N		2	2	3	8				15	2.03	36
	%		13.3	13.3	20.0	53.3						
Middle 1/5 on Both HSPR and ACE	N			2	3	9	3	1		18	2.22	42
	%			11.1	16.7	50.0	16.7	5.5				
Top 1/5 on HSPR and and Bottom 1/5 on ACE	N		1	1	1	1	4	1		9	2.56	64
	%											
Bottom 1/5 on HSPR and Top 1/5 on ACE	N				2	4	6	2	1	15	2.62	65
	%				13.3	26.7	40.0	13.3	6.7			
Top 2/5 on Both	N	2	1	3	7	25	35	32	29	134	2.91	77
	%	1.5	.7	2.2	5.2	18.7	26.1	23.9	21.6			
Bottom 2/5 on Both	N		7	18	20	32	15	3	1	96	2.04	36
	%		7.3	18.7	20.8	33.3	15.6	3.1	1.0			

College of Literature, Science, and the Arts Number of Students: 1808

GPA According to HSPR

GPA	N	%	No HSPR	HSPR Fifth					Med HSPR
				1	2	3	4	5	
				00-70	71-82	83-89	90-95	96-99	
3.5-4.00	126	7.0	3	3	9	20	32	59	95.0
3.0-3.49	281	15.5	3	29	32	57	67	93	91.4
2.5-2.99	340	18.8	2	43	50	77	106	62	89.4
2.0-2.49	543	30.0	7	129	119	115	118	55	83.7
1.5-1.99	226	12.5	4	72	58	45	36	11	78.6
1.0-1.49	167	9.2	1	66	46	31	19	4	74.9
.5-.99	49	2.7	2	25	13	8	1		65.8
.0-.49	22	1.2		12	5	3	1	1	64.6
No GPA	54	3.0	6	11	10	12	9	6	84.3
N	1808	99.9	28	390	342	368	389	291	85.5
%			1.5	21.6	18.9	20.4	21.5	16.1	
Med GPA	2.38		2.28	2.05	2.18	2.38	2.56	3.05	

GPA According to ACE

GPA	No ACE	ACE Fifth					Med ACE
		1	2	3	4	5	
		000-102	103-113	114-124	125-138	139-190	
3.5-4.00	2	1	9	19	37	58	137.0
3.0-3.49	7	13	35	46	87	93	131.4
2.5-2.99	3	37	62	78	100	60	123.3
2.0-2.49	5	119	115	134	119	51	116.4
1.5-1.99	8	65	40	57	33	23	114.3
1.0-1.49	4	60	37	36	20	10	108.9
.5-.99		25	10	9	4	1	100.0
.0-.49	2	11	3	3	2	1	93.2
No GPA	6	20	8	6	8	6	108.0
N	37	351	319	388	410	303	119.6
%	2.0	19.4	17.6	21.5	22.7	16.8	
Med GPA	2.15	2.01	2.28	2.32	2.61	3.01	

LSA Median GPA-RS= 2.38 Median HSPR-RS= 85.5 Median ACE-RS= 119.6

LSA Median GPA-PR= 52 Median HSPR-PR= 48 Median ACE-PR= 53

College of Literature, Science, and the Arts Number of Students: 1703

GPA According to Serial Combinations of HSPR and ACE

Group		GPA 1 0- .49	 2 .5- .99	 3 1.0- 1.49	 4 1.5- 1.99	 5 2.0- 2.49	 6 2.5- 2.99	 7 3.0- 3.49	 8 3.5- 4.0	N	Med GPA-RS	Med GPA-PR
All Freshmen Having Both HSPR and ACE	N	20	47	162	214	531	335	273	121	1703	2.38	52
	%	1.2	2.8	9.5	12.6	31.2	19.7	16.0	7.1			
Top 1/5 on Both HSPR and ACE	N				3	7	9	33	23	75	3.26	90
	%				4.0	9.3	12.0	44.0	30.7			
Bottom 1/5 on Both HSPR and ACE	N	6	9	19	24	31	4			93	1.76	22
	%	6.5	9.7	20.4	25.8	33.3	4.3					
Middle 1/5 on Both HSPR and ACE	N		1	5	11	22	19	8	5	71	2.42	53
	%		1.4	7.0	15.5	31.0	26.8	11.3	7.0			
Top 1/5 on HSPR and Bottom 1/5 on ACE	N			2	2	7	6	2		19	2.39	52
	%			10.5	10.5	36.8	31.6	10.5				
Bottom 1/5 on HSPR and Top 1/5 on ACE	N		1	5	6	13	13	11	2	51	2.51	58
	%		2.0	9.8	11.8	25.5	25.5	21.6	3.9			
Top 2/5 on Both	N	1		4	15	57	82	101	69	329	3.02	82
	%	.3		1.2	4.6	17.3	24.9	30.7	21.0			
Bottom 2/5 on Both	N	10	26	61	61	119	26	9	1	313	1.98	27
	%	3.2	8.3	19.5	19.5	38.0	8.3	2.9	.3			

School of Music

Number of Students: 94

GPA According to HSPR

GPA	N	%	No HSPR	HSPR Fifth					Med HSPR
				1	2	3	4	5	
				00-76	71-82	83-89	90-95	96-99	
3.5-4.00	10	10.6		1			2	7	96.6
3.0-3.49	29	30.9			3	4	11	11	93.6
2.5-2.99	29	30.9	1	5	9	6	5	3	82.5
2.0-2.49	18	19.1		7	3	8			78.5
1.5-1.99	4	4.3		2	1	1			---
1.0-1.49	1	1.1		1					--
.5-.99	0								
0-.49	0								
No GPA	3	3.2	1				1	1	95.5
N	94		2	16	16	19	19	22	87.7
%			2.1	17.0	17.0	20.2	20.2	23.4	
Med GPA	2.88			2.35	2.72	2.54	3.18	3.34	

GPA According to ACE

GPA	No ACE	ACE Fifth					Med ACE
		1	2	3	4	5	
		000-102	103-113	114-124	125-138	139-190	
3.5-4.00				1	2	7	150.5
3.0-3.49		2	3	11	6	7	123.0
2.5-2.99		13	4	6	3	3	106.6
2.0-2.49		11	4	1	2		83.5
1.5-1.99		2		1	1		--
1.0-1.49						1	
.5-.99							
0-.49							
No GPA	1		1	1			113.5
N	1	28	12	21	14	18	116.9
%	1.1	29.8	12.8	22.3	14.9	19.1	
Med GPA		2.53	2.68	3.09	3.08	3.35	

Music

Median GPA-RS 2.88 Median HSPR-RS 87.7 Median ACE-RS 116.9

Median GPA-PR 76 Median HSPR-PR= 55 Median ACE-PR= 46

School of Music   Number of Students: 90

GPA According to Certain Combinations of HSPR and ACE

Group		GPA								N	Med GPA-RS	Med GPA-PR
		1	2	3	4	5	6	7	8			
		0-.49	.5-.99	1.0-1.49	1.5-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0			
All Freshmen Having Both HSPR and ACE	N			1	4	18	28	29	10	90	2.89	77
	%			1.1	4.4	20.0	31.1	32.2	11.1			
Top 1/5 on Both HSPR and ACE	N						1	4	6	11	3.54	96
	%						9.1	36.4	54.5			
Bottom 1/5 on Both HSPR and ACE	N				2	7	2			11	2.25	43
	%				18.2	63.6	18.2					
Middle 1/5 on Both HSPR and ACE	N						1	2		3	--	
	%											
Top 1/5 on HSPR and Bottom 1/5 on ACE	N						2			2		
	%											
Bottom 1/5 on HSPR and Top 1/5 on ACE	N			1			1			2		
	%											
Top 2/5 on Both	N						1	10	8	19	3.42	92
	%						5.3	52.6	42.1			
Bottom 2/5 on Both	N				2	9	11	1		23	2.52	68
	%				8.7	39.1	47.8	4.3				

School of Natural Resources Number of Students: 20

GPA According to HSPR

GPA	N	%	HSPR Fifth					Med HSPR
			1	2	3	4	5	
			00-70	71-82	83-89	90-95	96-	
3.5-4.00	1	5	1					--
3.0-3.49	3	15	1	1		1		--
2.5-2.99	3	15			2	1		--
2.0-2.49	8	40	3	4	1			--
1.5-1.99	1	5		1				--
1.0-1.49	3	15	2			1		--
.5-.99								--
.0-.49								--
No GPA	1	5		1				--
N	20		7	7	3	3		75.6
%			35	35	15	15		
Med GPA	2.34							

GPA According to ACE

GPA	ACE Fifth					Med ACE
	1	2	3	4	5	
	000-102	103-113	114-124	125-138	139-190	
3.5-4.00				1		--
3.0-3.49			1	2		--
2.5-2.99	1		1	1		--
2.0-2.49	2		3	1	2	120.8
1.5-1.99		1				--
1.0-1.49	1	1	1			--
.5-.99						--
.0-.49						--
No GPA					1	--
N	4	2	6	5	3	120.8
%	20	10	30	25	15	

Natural Resources

Median GPA-RS= 2.34 Median HSPR-RS= 75.6 Median ACE-RS= 120.8

Median GPA-PR= 51 Median HSPR-PR= 26 Median ACE-PR= 55

School of Natural Resources Number of Students: 19

GPA According to Certain Combinations of HSPR and ACE

Group		GPA								N	Med GPA-RS	Med GPA-PR
		1	2	3	4	5	6	7	8			
		.0- .49	.5- .99	1.0- 1.49	1.5- 1.99	2.0- 2.49	2.5- 2.99	3.0- 3.49	3.5- 4.0			
All Freshmen Having Both HSPR and ACE	N			3	1	8	3	3	1	19	2.34	51
	%			15.8	5.3	42.1	15.8	15.8	5.3			
Top 1/5 on Both HSPR and ACE	N									0		
	%											
Bottom 1/5 on Both HSPR and ACE	N									0		
	%											
Middle 1/5 on Both HSPR and ACE	N					1	1			2		
	%											
Top 1/5 on HSPR and Bottom 1/5 on ACE	N									0		
	%											
Bottom 1/5 on HSPR and Top 1/5 on ACE	N					2				2		
	%											
Top 2/5 on Both	N									0		
	%											
Bottom 2/5 on Both	N			1	1	2				4		
	%											

School of Nursing   Number of Students: 215

GPA According to HSPR

GPA	N	%	No HSPR	HSPR Fifth 1 00-70	2 71-82	3 83-89	4 90-95	5 96-99	Med HSPR
3.5-4.00	6	2.8	1				2	3	--
3.0-3.49	23	10.7			4	2	3	14	96.2
2.5-2.99	37	17.2		1	2	9	10	15	93.4
2.0-2.49	75	34.9	2	11	18	13	17	14	86.5
1.5-1.99	28	13.0	1	4	7	5	11		86.0
1.0-1.49	30	14.0		4	11	11	4		82.5
.5-.99	4	1.9			3	1			--
.0-.49	1	.5					1		--
No GPA	11	5.1	4	1	3	2		1	80.5
N	215		8	21	48	43	48	47	88.1
%			3.7	9.8	22.3	20.0	22.3	21.9	
Med GPA	2.26			2.09	2.04	2.13	2.20	2.80	

GPA According to ACE

GPA	No ACE	ACE Fifth 1 000-102	2 103-113	3 114-124	4 125-138	5 139-190	Med ACE
3.5-4.00		1		1	1	3	--
3.0-3.49	1	1	2	4	2	13	145.0
2.5-2.99		5	9	9	8	6	119.0
2.0-2.49		21	21	20	9	4	111.1
1.5-1.99	2	8	9	5	2	2	108.6
1.0-1.49		16	6	4	4		95.6
.5-.99		3	1				--
.0-.49		1					--
No GPA	1	3	3	1	1	2	109.8
N	4	59	51	44	27	30	112.5
%	1.9	27.4	23.7	20.5	12.6	14.0	
Med GPA		2.00	2.19	2.31	2.38	3.07	

Median GPA-RS= 2.26   Median HSPR-RS= 88.1   Median ACE-RS= 112.5

Nursing

Median GPA-PR= 43   Median HSPR-PR= 56   Median ACE-PR= 38

School of Nursing   Number of Students: 198

GPA According to Certain Combinations of HSPR and ACE

Group		GPA								N	Med GPA-RS	Med GPA-PR
		1	2	3	4	5	6	7	8			
		0-.49	.5-.99	1.0-1.49	1.5-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0			
All Freshmen Having Both HSPR and ACE	N	1	4	30	26	73	37	22	5	198	2.26	43
	%	.5	2.0	15.2	13.1	36.9	18.7	11.1	2.5			
Top 1/5 on Both HSPR and ACE	N						3	9	1	13	3.19	86
	%						23.1	69.2	7.7			
Bottom 1/5 on Both HSPR and ACE	N			2	2	3				7	1.87	25
	%											
Middle 1/5 on Both HSPR and ACE	N			1	1	2	2	1		7	2.37	52
	%											
Top 1/5 on HSPR and Bottom 1/5 on ACE	N					1	3	1		5		
	%											
Bottom 1/5 on HSPR and Top 1/5 on ACE	N									0		
	%											
Top 2/5 on Both	N				2	5	9	12	4	32	3.00	80
	%				6.3	15.6	28.1	37.5	12.5			
Bottom 2/5 on Both	N		3	10	7	18				38	1.92	25
			7.9	26.3	18.4	47.4						

College of Pharmacy Number of Students: 39

GPA According to HSPR

GPA	N	%	No HSPR	HSPR Fifth					Med HSPR
				1 00-70	2 71-82	3 83-89	4 90-95	5 96-99	
3.5-4.00									
3.0-3.49	4	10.3			1	2		1	86.0
2.5-2.99	8	20.5			2	3		3	87.1
2.0-2.49	9	23.1			4	2	2	1	84.3
1.5-1.99	7	17.9		1	3	1	2		80.5
1.0-1.49	7	17.9		2	2	1	1	1	79.5
.5-.99	1	2.6					1		--
0-.49	1	2.6		1					--
No GPA	2	5.1		2					
N	39			6	12	9	6	6	83.7
%				15.4	30.8	23.1	15.4	15.4	
Med GPA	2.13				2.12				

GPA According to ACE

GPA	No ACE	ACE Fifth					Med ACE
		1 000-102	2 103-113	3 114-124	4 125-138	5 139-190	
3.5-4.00							
3.0-3.49					1	3	152.5
2.5-2.99			1	3	4		124.5
2.0-2.49			4	3	2		115.3
1.5-1.99		1	4	1	1		109.4
1.0-1.49		3	2	1	1		105.3
.5-.99		1					--
0-.49					1		--
No GPA		2					
N		7	11	8	10	3	115.6
%		17.9	28.2	20.5	25.6	7.7	
Med GPA			1.93		2.50		

Pharmacy

Median GPA-RS= 2.13 Median HSPR-RS= 83.7 Median ACE-RS= 115.6
Median GPA-PR= 38 Median HSPR-PR= 42 Median ACE-PR= 44

Pharmacy Number of Students: 37

GPA According to Certain Combinations of HSPR and ACE

Group		GPA								N	Med GPA-RS	Med GPA-PR
		1	2	3	4	5	6	7	8			
		.0- .49	.5- .99	1.0- 1.49	1.5- 1.99	2.0- 2.49	2.5- 2.99	3.0- 3.49	3.5- 4.0			
All Freshmen Having Both HSPR and ACE	N	1	1	7	7	9	8	4	0	37	2.13	38
	%	2.7	2.7	18.9	18.9	24.3	21.6	10.8				
Top 1/5 on Both HSPR and ACE	N							1		1		
	%											
Bottom 1/5 on Both HSPR and ACE	N			1						1		
	%											
Middle 1/5 on Both HSPR and ACE	N			1			2			3		
	%											
Top 1/5 on HSPR and Bottom 1/5 on ACE	N			1						1		
	%											
Bottom 1/5 on HSPR and Top 1/5 on ACE	N									0		
	%											
Top 2/5 on Both	N					1	3	1		5		
	%											
Bottom 2/5 on Both	N			3	2	1	1			7	1.62	15
	%											

average of the PR's on HSPR and ACE, and this is given in the last column of Table 7.

Table 7

Quality and Performance of Freshmen in Various University Units

Unit	GPA-PR	HSPR-PR	ACE-PR	Average of PR's HSPR and ACE
Music	79	[illegible]	15	50.5
Dental Hygiene	[illegible]	[illegible]	[illegible]	42.[illegible]
Engineering	[illegible]	[illegible]	64	52.5
LSA	[illegible]	48	51	[illegible]
Natural Resources	51	26	[illegible]	40.5
Nursing	45	36	58	47.0
Arch. & Design	42	37	45	41.0
Pharmacy	38	42	44	[illegible]
Education	35	27	7	17.0
All Units	52	48	[illegible]	50.0

A few general comments concerning student quality in relation to the different University units (and later freshman courses) is appropriate. While the assessment variables selected for this investigation (relative standing in the high school graduating class and tested academic aptitude) probably cannot be surpassed as general overall assessors of academic quality they do not give very valid indications of musical, psychomotor, and some other special abilities which are essential for success in programs such as those offered by the School of Music and the School of Education's Physical Education Department.[2] It is possible, for example, for a student to have ranked in the top 5% of his high school graduating class, have an IQ of [illegible] but have no musical talent; such a student would fail in the School of Music. The reverse, while possible is improbable: a student who ranked in the bottom half of his high school graduating class and had an IQ of 95 might have considerable musical skill or talent, but such a student is also likely to do poorly in the School of Music. Certain of the

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[2] It is important to mention that all the Education School freshmen are enrolled in Physical Education or Industrial Arts; entering freshmen desiring other education specialties or concentrations enroll in LSA before transferring to Education.

It is also important to note that the unit in which HSPR and ACE are most closely related to GPA is the Music School. The relationships are also very strong for freshmen in the School of Education. Some of this may appear paradoxical and inconsistent at first, the explanation lies mostly in the fact that these freshmen are heterogeneous with respect to HSPR and ACE even though they may be quite homogeneous with respect to other abilities and traits.

[illegible] theory and required LSA courses would be almost certain to bring about his failure.

It would seem that a certain minimum amount of *general academic ability* (as measured by HSPR and an aptitude test score) is necessary for success at the University regardless of specialty or concentration.

Another aspect not yet mentioned is related to the sex of the student. Tables 8 and 9 show the GPA's, HSPR's, and ACE's of the University's freshmen men and women. While the GPA's of the men and women are identical this does not necessarily mean that their academic accomplishment is the same. Women tend not to take the difficult courses and programs. There is some evidence to show that a disproportionate number of women tend to enroll in courses where grading is fairly liberal, and tend not to enroll in courses where grading is difficult; some pertinent findings will be given later on. The tables also show freshmen women at the University have higher HSPR's than freshmen men, but the freshmen men have higher ACE's. This should be kept in mind when examining the data on the University units (and, later, the freshman courses). Certain units such as Engineering enroll a negligible number of women and certain other units such as Nursing enroll a negligible number of men.

Perhaps of greater importance for the University (and for all higher education institutions faced with the problem of selecting good students and making the best use of their faculty, space, and facilities) is the fact that the typical female high school graduate ranks higher than about 59% of all high school graduates[22] and the typical male graduate ranks higher than about 42%. The male and female graduates have approximately equal tested aptitude scores, but when differences are found they tend to be in favor of the male high school graduate. The significance of this is that the women who enter the University (and for that matter other institutions not making systematic use of aptitude scores in their admissions process) tend not to be screened as rigorously as men. For example, a female freshman who ranked higher than 70% of her high school graduating class is not as much above the average female in her high school graduating class as is a male freshman who ranked higher than 70%. The female is only 11 percentage points above her sex average but the male is 28 percentage points above his. According to the high school record *per se* many more women than men *look* qualified for college, and are able to gain admission out of proportion to their college ability or their academic and professional interest. Some formal studies and many informal ones suggest that many women go to college to find a suitable mate, or go because their families' financial situations do not require them to become gainfully employed, or go for some other non-academic or non-professional reasons.

Since throughout the country women *applicants* for admission to college have superior high school records and inferior tested aptitude an institution which depends almost exclusively on the high school record for identifying

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[22] Some believe high school girls receive better grades because they cause less trouble, are more docile, are neater, elect somewhat less demanding courses, etc.

[illegible] Men [illegible] 1963

[illegible]

	N No HSPR	HSPR Fifth 1 60-70	2 71-82	3 [illegible]	4 90-[illegible]	5 [illegible]-99	Med HSPR
N	2[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	83.3
%	1.6	24.8	32.2	18.8	[illegible]	[illegible]	

	N No ACE	ACE Fifth 1 60-102	2 103-113	3 114-124	4 125-138	5 139-184+	Med ACE
N	34	262	272	341	375	311	121.6
%	2.[illegible]	15.[illegible]	17.2	21.5	23.[illegible]	19.[illegible]	

Group		Overall GPA 1 0-.49	2 .5-.99	3 1.0-1.49	4 1.5-1.99	5 2.0-2.49	6 2.5-2.99	7 3.0-3.49	8 3.5-4.0	N	Med GPA-RS	Med GPA-PR
All Freshmen Having Both HSPR and ACE	N	17	48	156	227	432	320	236	106	1543	2.37	52
	%	1.1	3.1	10.1	14.7	28.0	20.7	15.3	6.9			
Top 1/5 on Both HSPR and ACE	N	0	0	0	1	9	15	24	26	75	3.26	87
	%				1.3	12.0	20.0	32.0	34.7			
Bottom 1/5 on Both HSPR and ACE	N	2	7	11	20	26	5	1	0	72	1.90	25
	%	2.8	9.7	15.3	27.8	36.1	6.9	1.4				
Top 2/5 on Both	N	2	1	3	11	47	77	79	68	288	3.01	82
	%	.7	.3	1.0	3.8	16.3	26.7	27.4	23.6			
Bottom 2/5 on Both	N	4	23	53	59	106	35	8	1	289	2.02	36
	%	1.4	8.0	18.3	20.4	36.7	12.1	2.8	.3			

Median GPA-RS= 2.37 Median HSPR-RS= 83.3 Median ACE-RS= 121.6
Median GPA-PR= 52 Median HSPR-PR= 41 Median ACE-PR= 56

University Women Number of Students: 1342

Table [illegible]

	No HSPR	HSPR Fifth 1	2	3	4	5	Med HSPR
		00-70	71-82	83-89	90-95	96-99	
N	31	192	251	276	321	271	87.8
%	2.3	14.3	18.7	20.6	23.9	20.2	

	No ACE	ACE Fifth 1	2	3	4	5	Med ACE
		00-102	103-113	114-124	125-138	139-184+	
N	20	330	267	288	258	179	115.9
%	1.5	24.6	19.9	21.5	19.2	13.3	

Group			Overall GPA 1	2	3	4	5	6	7	8	N	Med GPA-RS	Med GPA-PR
			.0-.49	.5-.99	1.0-1.49	1.5-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0			
All Freshmen		N	12	29	117	164	422	259	199	82	1284	2.37	52
		%	.9	2.3	9.1	12.8	32.9	20.2	15.5	6.4			
Top 1/5	On Both HSPR and ACE	N	0	0	1	2	4	10	33	14	64	3.22	87
		%			1.6	3.1	6.2	15.6	51.5	21.8			
Bottom 1/5		N	4	5	18	15	25	2			69	1.75	22
		%	5.8	7.2	26.1	21.7	36.2	2.9					
Top 2/5		N	1		5	13	44	58	84	43	248	3.01	82
		%	.4		2.0	5.2	17.7	23.4	33.9	17.3			
Bottom 2/5		N	6	14	50	48	90	22	7	1	238	2.00	31
		%	2.5	5.9	21.0	20.2	37.8	9.2	2.9	.4			

Median GPA-RS= 2.37
Median GPA-PR= 52

Median HSPR-RS= 87.8
Median HSPR-PR= 55

Median ACE-RS= 115.9
Median ACE-PR= 44

qualified students (without systematically considering aptitude test information) will tend to select a disproportionate number of women from among more or less equally able groups of college-going male and female high school graduates.

Before presenting a possible procedure for dealing with the admissions problem at the University of Michigan brief attention will first be given to the quality and performance of students graduated from Michigan and non-Michigan high schools and of freshmen enrolled in selected courses at the University.

Table 10 presents data on 1854 freshmen who were graduated from Michigan high schools and Table 11 presents data on 1071 freshmen from non-Michigan high schools. From these tables it can be seen that the latter students obtain somewhat higher GPA's, have somewhat higher ACE's, but slightly lower HSPR's. While the ratio of ''inferior'' to ''superior'' freshmen favors the non-Michigan graduates a surprisingly large number of the non-Michigan graduates, 169, would be classed as ''inferior.'' This is surprising because admission requirements for non-residents are thought to be quite high.*

Actually only 150 of the 169 non-Michigan high school graduates can be classed as non-residents. Table 12 presents data on 86 freshmen who graduated from non-Michigan high schools but are residents of the state. Some of the 86 may have been Michigan residents before they were graduated from high school but probably most of them were not. It can be seen that 19 of the 86 are in the bottom fifth on both HSPR and ACE. (Tables for ''residents'' and ''non-residents'' are not given in this report to keep to a minimum the number of tables presented. Anyone interested in comparing Michigan residents with non-Michigan residents can do so by subtracting the number of cases in Table 12 from those in Table 11 and adding them to the cases in Table 10.)

The students enrolled in each freshman course at the University have been studied in essentially the same way as freshmen in other groups but some additional analyses have been made. The grades (A, B, C, D, and E) freshmen received in each course were contrasted with the total GPA's these same freshmen obtained. Since the total or overall GPA for each freshman is based in part upon the grade of the specific course with which it is being contrasted the difference between the median course grade and the median GPA obtained by these freshmen is not the same as the difference between the median course grade and the median grade in other courses taken by the students. Ideally it would have been desirable to make the latter type of comparison but in view of the large number of courses and students this was not feasible.

Table 13 presents for 17 LSA courses the median course grade obtained by the freshmen enrolled in each course and the median overall GPA obtained by these freshmen, as well as their median HSPR and ACE; the last column contains the average of the PR on HSPR and ACE. By comparing the median course grade with the median overall GPA a rough measure of what might be called ''overgrading'' and ''undergrading'' may be obtained. For example the grades given students in Course A are essentially the same as those given these same students

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* Children of alumni are treated as residents.

Michigan High School Graduates　　　Number of Students: 1854

Table 10

		HSPR Fifth					
		1	2	3	4	5	
	No HSPR	00-70	71-82	83-89	90-95	96-99	Med HSPR
N	24	379	368	337	394	352	86.0
%	1.3	20.4	19.8	18.2	21.3	19.0	

		ACE Fifth					
		1	2	3	4	5	
	No ACE	00-102	103-113	114-124	125-138	139-184+	Med ACE
N	29	394	375	414	370	272	115.9
%	1.6	21.3	20.2	22.3	20.0	14.7	

Group		Overall GPA										
		1	2	3	4	5	6	7	8			
		.0-.49	.5-.99	1.0-1.49	1.5-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0	N	Med GPA-RS	Med GPA-PR
All Freshmen Having Both HSPR and ACE	N	18	59	187	275	558	354	254	106	1811	2.32	51
	%	1.0	3.3	10.3	15.2	30.8	19.5	14.0	5.9			
Top 1/5 on Both HSPR and ACE	N				1	7	15	37	24	84	3.25	87
	%				1.2	8.3	17.9	44.0	28.6			
Bottom 1/5 on Both HSPR and ACE	N	4	11	21	26	29	3	1		95	1.72	17
	%	4.2	11.6	22.1	27.4	30.5	3.2	1.1				
Top 2/5 on Both	N	1	1	4	19	57	88	104	64	338	2.99	77
	%	.3	.3	1.2	5.6	16.9	26.0	30.8	18.9			
Bottom 2/5 on Both	N	6	30	75	72	133	32	9	1	358	1.97	27
	%	1.7	8.4	20.9	20.1	37.1	8.9	2.5	.3			

Median GPA-RS= 2.32　　Median HSPR-RS= 86.0　　Median ACE-RS= 115.9

Median GPA-PR= 51　　Median HSPR-PR= 49　　Median ACE-PR= 44

Non-Michigan High School Graduates Number of Students: 1071

Table 11

	No HSPR	HSPR Fifth					Med HSPR
		1	2	3	4	5	
		00-70	71-82	83-89	90-95	96-99	
N	32	206	234	236	227	136	84.9
%	3.0	19.2	21.8	22.0	21.2	12.7	

	No ACE	ACE Fifth					Med ACE
		1	2	3	4	5	
		00-102	103-113	114-124	125-138	139-184+	
N	25	188	164	215	261	218	122.2
%	2.3	17.6	15.3	20.1	24.4	20.4	

Group		Overall GPA								N	Med GPA-RS	Med GPA-PR
		1	2	3	4	5	6	7	8			
		.0-.49	.5-.99	1.0-1.49	1.5-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0			
All Freshmen Having Both HSPR and ACE	N	11	18	87	118	299	229	185	83	1030	2.46	54
	%	1.1	1.7	8.4	11.5	29.0	22.2	18.0	8.1			
Top 1/5 on Both HSPR and ACE	N				2	6	10	20	16	54	3.22	87
	%				3.7	11.1	18.5	37.0	29.6			
Bottom 1/5 on Both HSPR and ACE	N	2	1	8	9	22	4			46	2.06	36
	%	4.3	2.2	17.4	19.6	47.8	8.7					
Top 2/5 on Both	N	2		3	5	34	47	59	47	197	3.06	82
	%	1.0		1.5	2.5	17.3	23.9	29.9	23.9			
Bottom 2/5 on Both	N	4	7	28	35	63	25	6	1	169	2.08	37
	%	2.4	4.1	16.6	20.7	37.3	14.8	3.6	.6			

Median GPA-RS= 2.46 Median HSPR-RS= 84.9 Median ACE-RS= 122.2

Median GPA-PR= 54 Median HSPR-PR= 47 Median ACE-PR= 57

Michigan Residents from Non-Michigan High Schools   Number of Students: 86

Table 12

		HSPR Fifth					
		1	2	3	4	5	
	No HSPR	00-70	71-82	83-89	90-95	96-99	Med HSPR
N	5	33	17	10	10	11	75.8
%	5.8	38.4	19.8	11.6	11.6	12.8	

		ACE Fifth					
		1	2	3	4	5	
	No ACE	00-102	103-113	114-124	125-138	139-184+	Med ACE
N	2	13	17	21	18	15	119.8
%	2.3	15.1	19.8	24.4	20.9	17.4	

		Overall GPA										
		1	2	3	4	5	6	7	8			
Group		.0-.49	.5-.99	1.0-1.49	1.5-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0	N	Med GPA-RS	Med GPA-PR
All Freshmen Having Both HSPR and ACE	N	1	2	7	13	22	18	12	5	80	2.38	52
	%	1.3	2.5	8.8	16.3	27.5	22.5	15.0	6.3			
Top 1/5 on Both HSPR and ACE	N						2	1	1	4		
	%						50.0	25.0	25.0			
Bottom 1/5 on Both HSPR and ACE	N					1	1			2		
	%					50.0	50.0					
Top 2/5 on Both	N	1					5	5	2	13	3.10	85
	%	7.7					38.5	38.5	15.4			
Bottom 2/5 on Both	N		1	1	7	4	4	2		19	2.06	36
	%		5.3	5.3	36.8	21.1	21.1	10.5				

Median GPA-RS= 2.38   Median HSPR-RS= 75.8   Median ACE-RS= 119.8

Median GPA-PR= 52   Median HSPR-PR= 26   Median ACE-PR= 53

Table 13

Student Quality and Freshman Grades in Selected LSA Courses

Course	Course Grade Median RS	Course Grade U/M PR	Overall GPA Median RS	Overall GPA U/M PR	HSPR Median RS	HSPR U/M PR	ACE Median RS	ACE U/M PR	Average of PR on HSPR & ACE
A	2.33	51	2.29	50	85.8	49	120.7	54	51.5
B	2.90	77	2.62	65	85.5	48	123.6	60	54.0
C	2.40	53	2.25	43	82.5	39	113.7	40	39.5
D	2.32	51	2.25	43	77.0	27	115.2	43	35.0
E	2.38	52	2.71	67	88.9	59	137.3	78	68.5
F	2.95	77	3.28	90	95.9	83	145.5	88	85.5
G	2.22	42	2.19	39	77.7	29	112.9	39	34.0
H	2.41	53	2.52	58	90.7	63	114.1	41	52.0
I	2.06	36	2.19	39	80.1	35	119.9	53	44.0
J	2.38	52	2.42	53	79.3	34	117.7	48	41.0
K	2.20	40	2.36	52	79.9	35	115.3	43	39.0
L	2.61	65	2.62	65	87.9	55	120.8	55	55.0
M	2.33	51	2.43	53	85.5	48	123.1	59	53.5
N	2.60	65	2.52	58	87.1	51	122.6	58	54.5
O	2.12	38	2.35	52	86.1	49	119.1	52	50.5
P	3.00	80	2.42	53	84.8	46	114.5	42	44.0
Q	2.19	39	2.35	52	87.6	54	121.3	56	55.0

in the other courses they took. In Course B the grades are higher than those given in the other courses. One reason why the median overall GPA of the students in Course B is high is because high grades in Course B were given; for most students it is one of the four grades making up the overall GPA. But another reason is that these Course B students tended to be enrolled in other courses which grade liberally (i.e., a disproportionately large number enroll in Courses such as C, D, J, L, N, and P, and not in Courses such as E, F, O, and Q of Table 13). Probably a more precise measure of the extent of "overgrading" and "undergrading" can be obtained by comparing the median course grade PR with the average PR on HSPR and ACE (given in the last column of Table 13). When this is done it can be seen that Course A grades are in line with the quality of the students but Course B grades are "23 PR points" off.

It is important to mention that this phase of the investigation was conducted on only those freshmen for whom both HSPR and ACE information was available. Also, freshmen given grades of "Incomplete" and grades other than A, B, C, D, and E were not considered. The number excluded for these reasons is very small, almost always less than 5% of the number of first semester freshmen enrolled in each course.

These 17 courses were selected because they illustrate the variety of patterns of student quality, grading practices, and, in a certain sense, the academic standards of the freshman courses. The number of freshmen in these courses ranged from 23 to 468 with a median number of 63.

In almost every one of these 17 courses and over 100 others which were analyzed the freshmen in the bottom two-fifths on HSPR and ACE received substantially lower grades than the freshmen in the top two-fifths on both. But in certain courses freshmen in the "bottom fifth on both" averaged higher grades than the freshmen in other courses who were in the "top two-fifths on both."

Tables 14 and 15 present complete data on two LSA foreign language courses; each one is the first (or introductory) course offered by the Department. The average grade the students are given in these courses is the same but the students differ quite markedly in quality. It is to be noted that the median overall GPA of the students in Course X is the same as the median course grade indicating that the other courses taken by these able students tend also to be "stiff grading."

Data similar to those in Tables 14 and 15 have been assembled for each course in each unit at the University enrolling at least 10 freshmen. Each department (Chairman) will receive (separate from this report) several copies of the analysis made of the freshmen in its courses. For each course separate tables for freshmen from the various units have been prepared (but, again, only if there are at least 10 freshmen from a particular unit). Several complete sets of the course analyses will be given each unit's Dean or administrative head as well as to certain other officers and agencies of the University. Interested faculty committees will be furnished complete sets upon request.

[illegible]

[illegible]	ACT Part	[illegible]
[illegible]	[illegible]	[illegible]

Group	[illegible]	Mean GPA
After [illegible]	[illegible]	2.6[illegible]
Percent	41.1 30.0 30.6 19.2 [illegible]	
[illegible]	1 11 4 10 [illegible]	
[illegible]	[illegible]	

[illegible]

[illegible]

Quartiles and [illegible] Freshmen in Course [illegible]

	HSPR PRK					
	1	2	3	4		
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N	61	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
%	23	[illegible]	[illegible]	27.3	11	

	ACE PER					
	1		3	4		
	0-92	93-	114-	125-	140-	Med
	[illegible]	113	124	139	1[illegible]	ACE
N	[illegible]	[illegible]	[illegible]	48	27	[illegible]
%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

Group			Course Grade				Med	
		E-0	D-1	C-2	B-3	A-4	[illegible]	N
All Freshmen Having [illegible]	N	20	30	92	74	[illegible]	2.46	[illegible]
	%	7.7	11.[illegible]	34.2	28.[illegible]	[illegible]		
Top 1/5	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Bottom 1/5	N	[illegible]	[illegible]	12	[illegible]	[illegible]		[illegible]
Top 2/5	N	[illegible]	[illegible]	[illegible]	17	[illegible]		[illegible]
Bottom 2/5	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]

Joint HSPR & ACE

	Overall GPA								
	1	2	3	4	5	6	7	8	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Med
	[illegible]	[illegible]	[illegible]	[illegible]	2.4[illegible]	[illegible]	[illegible]	4.0	GPA
N	[illegible]	[illegible]	[illegible]	35	[illegible]	42	31	11	[illegible]
%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

Median Course Grade-Row [illegible] Med. Overall GPA-Row [illegible] Med. HSPR-Row 82 Med. ACE-Row [illegible]

15A

Median [illegible] Med. HSPR-PR [illegible] Med. ACE-PR [illegible]

A more limited analysis has been made of many courses enrolling fewer than 10 freshmen but these are not being duplicated for distribution. Any department or member of a department desiring this information may have it; if the analysis has not yet been made it will be done on request. The courses described in Tables 13, 14, and 15 are not identified in the belief that the majority of faculty members would prefer not to have the information on their courses circulated throughout the University. Many unfair and unfruitful comparisons might be made. While it does appear that some instructors have "overgraded" their freshmen and some others have "undergraded" theirs this may have been done unknowingly because a "frame of reference" was unavailable. (The data in this report provide , perhaps, one kind of frame of reference or norms.) Overgrading and undergrading, however, may have been done deliberately to please and attract students and to encourage them to continue courses in the area, or to screen out and discourage all but the clearly able students from crowded and competitive areas, or to accomplish some other purpose the instructor felt was justifiable.

But from all this it would seem to be incorrect to describe a student as a "Michigan LSA B student," for example, since students of the same quality receive different grades depending upon the courses selected, and students of different quality receive identical grades for the same reason. A more correct statement would be "he's a Michigan LSA History 11 B student," etc. But perhaps any statement of the order "he's a B student" is more or less meaningless.

Before discontinuing the discussion of course grades in relation to student quality the relation of the sex of the student to "undergrading" and "overgrading" (or high standards versus low standards) might be mentioned briefly. It is of more than incidental interest to find that the freshmen enrolled in Course X, the stiff grading course, are mostly men (i.e., about 65% men, 35% women) but the freshmen in Course Y are almost evenly split between men and women (i.e., about 51% men, 49% women). Since of the freshmen enrolled in LSA about 47% are men it is apparent that a considerable "sex imbalance" is present in Course X. An imbalance is usually found in courses where grades seem to be "too high" or "too low" in relation to the quality of the students. For example the percentage of men in courses B, E, F, and P listed in Table 13 are 37, 91, 88, and 36 respectively; in courses B and P the students seem to be "over graded" and in courses E and F they seem to be "undergraded." (Course C of Table 13 is Course Y of Table 15.)

It would seem that a GPA of 2.30 means more for a male than for a female student, mostly because the courses they take tend to have different grading standards. It is unlikely that the same amount of achievement, learning, or education is represented by the GPA's of men and women. (The familiar problem again! Rather than "that student is a B student" it would be more correct to say "that student is a male B student," and "that student is a female B student.")

The concern of this report, however, is not primarily with grading practices and sex differences but with the qualifications necessary for admission to the University of Michigan. All evidence collected for this report suggests that a considerable number of freshmen who are admitted do not meet the academic standards now set for them. Few courses have an oversupply of students with high level talent.

The need for an effective plan to exclude the academically weak and attract and enroll the academically strong students is indicated. Such a plan is proposed herewith. The essential elements require that each applicant for admission present (or have presented for him) not only his position in his high school graduating class but also an academic aptitude test score. Specifically each applicant would be assessed by means of his HSPR and either the Scholarship Qualifying Test (SQT) for Michigan applicants or the Scholastic Aptitude Test (SAT) for non-Michigan (or non-resident) applicants.[23] Admission for the highly able according to these two criteria (HSPR and aptitude test) would be assured "automatically" and rejection for the definitely weak according to these criteria would also be automatic. Applicants not in the extreme groups (for automatic acceptance or rejection) might continue to be evaluated and admitted by current procedures. Some might argue that freshmen in the "middle" group are not strong enough or weak enough to have academic fitness serve as the sole criterion of admissibility; accordingly, principals recommendation, alumni connections, extracurricular record, subjective judgments of "potential contribution to the student body," "interest in college," "maturity," etc., might be used to select students from among the middle group.

While throughout the nation admissions officers, school principals, psychologists and others who evaluate students seem to believe they can identify potential talent and probable failures more accurately than the measures considered in this report, the evidence is pretty clear that they cannot.[24] There appears to be no evidence to indicate that an admissions officer or anyone else can spot from among top HSPR and aptitude students those who will be unsatisfactory college students, or spot from among the bottom HSPR and aptitude test students those who will be satisfactory. There is some reason to believe that such atypical performing students might be detected by some type of "motivation" or "academic personality" test but these tests are still in early stages of development and certainly not adequate for the task confronting the University.

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[23] Since non-residents are now required to take the SAT the only change would be for residents. The SQT is suggested for Michigan students since it costs only $1.00 per test-taker as opposed to $7.00 for the SAT. The high schools of the state probably should be encouraged to have all students in the upper half of their class tested with the SQT even though some may not be considering attendance at the University. In 1957 about 16,500, or about one quarter of Michigan's high school seniors were tested with the SQT according to the Educational Testing Service (located in Princeton, New Jersey) which supervised the administration of the test.

[24] For pertinent data and discussions see for example the paper, and the references cited in the paper, by Fricke, Benno G. "Tests, Students, Standards, and Admissions Officers" accompanying this report.

Although many alternative positions could be taken the following suggestions for admission to the University are made in view of the results disclosed by this investigation and the results disclosed by investigations of the predictive and assessment ability of the human evaluator. Although the proposed changes in admissions procedures are not as radical as many would like they represent a substantial step forward. (Favorable action on the proposed procedures, or some variation of them, would permit all freshmen entering in the Fall of 1960 to have been processed by them; but the spirit of the new admissions plan could affect the enrollment or non-enrollment of most potential applicants for the Fall of 1959 if appropriate information is distributed during the next six to eight months.) Each succeeding year for the next few years the "acceptable maximums" could be lowered and "unacceptable minimums" could be raised until the "middle" group would be reduced to a relatively small borderline group (equivalent to, say 15 to 25% of the 1955 freshmen).

To encourage and facilitate the enrollment of superior students the University should consider stating in its Announcements and pamphlets that it considers qualified for admission any Michigan resident with superior performance in high school and on an academic aptitude test. Specifically, admission would be guaranteed to those graduates of "accredited"[25] high schools whose HSPR is 90 or higher and whose University of Michigan aptitude test PR is 60 or higher (i.e., tested aptitude in the top 40% of the 1955 University freshmen). This is high enough to place him in the "top two fifths on both" groups of "superior" 1955 freshmen. The Fall 1955 freshmen are of value as a "control" or "reference" population. Table 1 which gives an objective description of them could be sent to the high schools with appropriate discussion as to its use. Although in a different format and for a different purpose the University has already distributed some of this information to schools and prospective students in its 1956 leaflet on Admission of Freshmen.

As indicated earlier about 20% of all 1955 freshmen performed at this level and would have qualified for "automatic admission." Table 10 shows that about 18% of the Michigan graduates would have qualified.

Also qualified for "automatic admission" would be those graduates whose HSPR and aptitude test PR's (in terms of the 1955 freshman norms given in Table 1) average 70 or higher. This would permit, for example, routine admission of a student with an HSPR-PR of 41 (according to Table 1 this represents high school performance superior to about 83% of the student's high school graduating class) and an aptitude test PR of 99. Similarly a student with an HSPR-PR of 59 (i.e., higher than 89% of his high school graduating class) would be automatically qualified for admission if his aptitude test PR was 81 or higher (according to Tables 1 and 2 this probably represents an IQ of about 131). In other words a student in the middle fifth on one variable would qualify for admission depending upon whether and where he ranked in the top fifth on the other.

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[25] High schools whose academic standards do not meet those recommended by the University might have their graduates evaluated according to the criteria suggested later for non-residents.

These criteria (top two fifths on both, or an average U of M PR of 70 or higher) would have given automatic admission to about 22% of the 1955 freshmen. The average student would have a predicted GPA of about 3.00.[26]

If the practice of enrolling non-residents to the extent of one third of the entering class is to be continued it might be wise to guarantee admission to a smaller percentage of non-residents than residents. Perhaps it should be announced that all non-residents with HSPR and test score high enough to place them in the "top fifth on both" of the 1955 freshmen are eligible for admission. Other non-residents whose University PR average is 85 or higher should also be admitted routinely.

The latter criterion would permit the admission of a student with an HSPR-PR of 71 and an aptitude PR of 99. Similarly a non-resident with an HSPR-PR of 79 would be qualified if his aptitude test PR was 91 or higher. In other words some students in the second highest fifth on one variable would qualify for admission depending upon whether and where they ranked in the top fifth on the other.

Perhaps one of the most desirable aspects of declaring publicly and explicitly the students the University will admit[27] is that many able students who do not now know how good they are, or whether they are qualified for work at Michigan would know where they stand and could make their plans accordingly. There is more than a little reason to believe that some top students who would like to come to Michigan do not even apply for admission.[28] It is unfortunate for the University (and these able students) that they enroll in other, generally inferior institutions where they are almost certain of admission. There probably is no good reason why the University could not assure these students admission by explicitly stating who is definitely eligible or qualified for admission.

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[26] It is assumed here and elsewhere that all students will have taken the high school courses specified as necessary by the unit in which the student desires to enroll.

[27] Three other aspects not discussed in this report are the favorable impact the proposed admissions procedures would have on legislators, taxpayers, and the public, the low cost in dollars and hours to the University, high school, and prospective student, and the possibility of communicating accurately to able students in need of financial assistance the criteria for scholarship awards (e.g., the University might state any Michigan high school graduate with financial need will be given a scholarship if he is in the "top fifth on both" or has an average PR of 85 or higher; the size of the scholarship would depend on the extent of need, as determined by current practice for some of the University scholarships).

[28] A nationwide study conducted for the American Council on Education in 1949 by Elmo E. Roper: Factors Affecting the Admission of High school Seniors to College disclosed that "about three out of ten high school students did not apply to their first choice college." One of the reasons suggested as a possible explanation for this was the student's "acceptance of rumor that the Institution was impossible to get into without some influence."

Since it is important that the University know how many new freshmen it will have before classes begin (e.g., for residence hall accommodation, etc.) it probably would be wise to require that everyone planning to enter "automatically" must make this known by a certain date, say June 1; it might even be desirable to require payment of a portion of the first semester fees by that date. Students not doing this would lose their "automatic admission" status and be considered for admission along with the "middle" group.

A strong case could be made for guaranteeing admission to a much larger number of students than is proposed in this report. Some units might wish to assure admission to residents who are in the "top half on both" or have an average University PR of 60 or higher. These criteria would have given routine admission to approximately the top 35% of 1955 resident freshmen. Their expected GPA is slightly below 3.00.

More non-residents might also be admitted automatically. The criteria might be "top two fifths on both" or an average PR of 70 or higher. Approximately 24% of the 1955 non-residents would have been admitted according to these criteria; the expected GPA is slightly above 3.00.

A lengthy application (which includes among other things the "Life Story" written by the student) for these "automatic admission" students would seem to be unnecessary. Basically all that would be needed is the high school principal or counselor's certification that the student had taken the courses required by the University unit, and that the HSPR and aptitude test information is correct. (A complete application with the high school record could be requested, of course). It is unlikely that the principal's recommendation for these students would be useful but may in fact prevent the enrollment of certain gifted but asocially oriented students. It would seem to be quite unwise to refuse admission to a student whose performance in high school and on the aptitude test was equivalent to a University PR average of 95 for example, regardless of how strongly a principal might feel such a student is "really not academic timber and is unqualified for work at Michigan."

A similar procedure is suggested to inform high school students and high school officials of the nature of students who are not considered qualified for admission to the University. An explicit statement to provide a "quality floor" would prevent most of the weak students from applying and being faced with rejection.

The suggestion is that the University's Announcements and pamphlets state that a Michigan resident who has not performed well in high school courses and on an aptitude test is ineligible for admission (regardless of how successfully he has performed in non-academic activities, who his parents are, etc.). Specifically admission would be denied a student whose HSPR is 70 or less and whose

University aptitude test PR is 19 or less. Other residents whose University PR average is 15 or lower would also be denied admission; thus a student with a PR of 00 on one variable and a PR of 30 on the other variable would be unqualified, as would a student with a PR of 10 on one and a PR of 20 on the other.

Of the 1955 resident freshmen about 6% would have been refused admission according to these criteria. Such students are essentially average high school graduates and they do not suceed at the University; their expected GPA is about 1.75. It would be best for these students, their families, the University, the taxpayers of the state, and society if they were not admitted to the University of Michigan.

Some units might wish to refuse admission to a larger number of students since the criteria for automatically admitting able students might produce a marked increase in the number of students to be educated at the University. Another alternative would be to reject more of the "middle" group who have submitted applications. But since students in the "bottom two-fifths on both" in some units (e.g. LSA) obtained a median GPA less than 2.00 these units might wish to reject more, "automatically." Perhaps rather than reject those in the bottom 40% (i.e., two fifths) on both it might be better for the first year to reject automatically those in the bottom 30% on both as well as those whose University PR average is 20 or lower. The median GPA of the 1955 freshmen who would have been rejected by these criteria is below 2.00.

To prevent applications from relatively weak non-residents it probably would be wise to state that a non-resident having an HSPR of 82 or lower and an aptitude test PR of 39 or lower is not admissible. Other non-residents whose University PR average is 30 or lower are also inadmissible. Approximately the bottom 20% of 1955 non-residents would have been excluded according to these criteria.

Students not falling into these extreme groups of "clearly eligible" and "clearly ineligible" on academic grounds would amount to almost three quarters of the 1955 freshmen. In a few years this large middle group could be reduced substantially by changing the criterion standards. Each year the University's Announcements would state that complete applications from students not clearly eligible or clearly ineligible according to high school and test performance would be considered on an individual basis but that preference would be given those having the best academic credentials. For these middle or borderline students factors such as principal's recommendation, alumni relationships, proficiency test scores, etc., might be taken into account as is currently done or planned.[29]

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[29] It might be desirable to suggest that prospective freshmen in the middle group take the College Board's Achievement Tests to demonstrate their academic fitness; those who perform well (e.g., all three scores above 550) might also be assured admission.

There are at least four reasons why the plan outlined above is likely to lead to the enrollment of a much larger number of high ability students at Michigan. The first has been mentioned already, namely that many able students who previously did not apply because they felt they might not be accepted would now have no doubt about their admissability (if they are in "the clearly eligible" group). A second reason is that the adoption of an admissions test (SQT for Michigan high school graduates and SAT for non-Michigan high school graduates) is likely to lead to the identification of many students with high academic potential who could be encouraged to enter the University. A third reason is that many able students who previously were uninterested in attending the University because they thought they would be unchallenged would see that weak students were not being admitted and might enroll in the University rather than a high tuition private Eastern college; this reason is more or less opposite the first but is at least equally important. A fourth reason is that use of an aptitude test (on which male applicants for college generally do better than female applicants) would tend to give male high school students a better opportunity to demonstrate their college fitness. Since the current selection procedures emphasize the high school achievement record and other matters almost to the exclusion of tested intellectual potential many able male students do not qualify by comparison with the female students. And since nationally college-going is primarily a male activity the "pool of college going applicants" would be increased by equalizing the opportunities between the sexes; the men will have higher aptitude test scores, the women will have higher HSPR's. (This is a new twist to the "equal opportunity for the sexes" controversy!)

One other value of the proposed admissions plan is that it is relatively easily implemented and unlikely to alienate the high school officials, at least by comparison with proficiency examinations or other methods which are perceived as interfering with the school's curriculum. Many able students might be lost to the University if a number of high schools were unable or unwilling to prepare their students specifically for the University. While a few schools send a substantial proportion of their graduates to Michigan most schools that send students send only 1 or 2 a year and consequently might be reluctant to make "University of Michigan oriented" curricular changes. Although almost any change in the University's admissions requirements is likely to meet with objections from some quarters there should be no major problems if the University requested that all prospective students take the SQT as one condition of admission. Some Michigan high schools already administer the SQT to all their students; most high schools which send the University students administer the SQT to at least a portion of their students. Last year almost 2,000 applicants for the University's Regents-Alumni Scholarships took the test. The University's Scholarship Office is not the only agency in the State which uses the SQT scores. The machinery for administering the SQT has been established and used; it would be a relatively simple matter to extend the testing program. At the present time the SQT costs each test-taker $1.00; since the College Board's SAT costs each student $7.00 there is good reason for requiring the SQT rather than the SAT of Michigan applicants. The SQT is given only once each year throughout the nation. Although its primary purpose initially was for selection of scholarship recipients, scores from the SQT are being used increasingly for the assessment of applicants to college.

The SAT which is administered throughout the nation six times a year presents no difficulty since it is already a requirement for admission of non-residents. However scores considered "satisfactory," "unsatisfactory," and "borderline" have not been announced.

It may be important for the University to move quickly because many other institutions are doing so. If other institutions succeed in draining off the superior talent it will be difficult to improve the quality of Michigan students. More than rumor has it that the quality of students enrolled at Michigan State has been increasing quite rapidly in recent years. Information supplied by a national sample of admissions officers indicates that freshmen they are now enrolling are somewhat better than a few years ago.

At the University of Michigan there has been no consistent change of any consequence in the aptitude, reading ability, and proficiency test scores of entering freshmen for the past five years at least.

Only a small amount of evidence is available to compare the Michigan freshmen of the 1930's with the Michigan freshmen of today. The tests that were given then are not given now. But sometime (some year!) the tests that were given about 20 to 30 years ago will be given entering freshmen to obtain comparable data.

Professor Paul Dwyer[30] published an extensive study of freshmen who entered the University in 1927 to 1936; it included HSPR data for one year, 1936. HSPR is the only assessment variable common to his study and the present one, and the only one that can be compared meaningfully. But even here comparability might be questioned since, as some believe, high school success 20 years ago does not mean the same thing as high school success today. The major points usually made in this connection are that today unlike 20 years ago almost everyone is passed along and graduated, and that today too much emphasis is placed on non-academic matters in high school. (The information given prospective students in current University publications probably tends to accentuate non-academic emphases. For example each *Announcement of the College of Literature, Science, and the Arts* for the past few years states in its first paragraph on *Admission* "The admission requirements are designed to ensure that each student who enters the College of Literature, Science, and the Arts has the intellectual capacity to pursue his work successfully and to make the most of the educational opportunities available to him. The quality and content of the entire high school record, as well as appraisals of the student's *personality and character* made by his principal and teachers, will be used for this purpose" (underlining added). The latter sentence may lead to the admission of high "social achievers," and the non-admission of *academically* qualified students who may not *look* good. In passing it should be noted that the first sentence quoted above along with the first sentence in the next section on Admission Requirements which is "Graduates of accredited high schools who have completed a four-year program of at least fifteen units of study may be admitted, provided their over-all high school record and other data clearly indicate probability of success in the College" (underlining added) might be questioned in view of the data from this investigation and from others. (The table on page 32 shows that the median GPA of the 93 LSA freshmen in the "bottom fifth on both" was 1.76; this indicates a student in the "bottom fifth on both" is expected to do unsatisfactory work.) Perhaps it would be best not to make any claims or promises of success for admitted students.

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[30] Dwyer, Paul S., Horner, Charlotte, and Yoakum, C. S. *A Statistical Summary of the Records of Students Entering the University of Michigan as Freshmen in the Decade 1927-1936.* Ann Arbor: University of Michigan Administrative Studies, Volume 1, Number 4, 1940.

Statements in other publications may also serve to discourage intellectually superior potential applicants and attract mediocre students with "superior" personalities. For example the University of Michigan's statement in The College Handbook 1957-58 of the College Entrance Examination Board indicates "The University has high selective admissions standards. Priority is given well-qualified Michigan residents and children of alumni. Only students with strong scholastic and personal records are admitted" (underlining added).

The University's special leaflet on Admission of Freshmen which was designed to help prospective freshmen states that freshmen are "chosen on the basis of probability of success in their chosen field of studies, potential for educational and personal development, possible contribution to the enrichment of the student body, and the likelihood of becoming alumni who reflect credit on the University."

The interpretation placed on the data in Table 16 will be conditioned by one's belief in the comparability of HSPR. If one believes a 1936 student with an HSPR of 80 is superior to a 1955 student with an HSPR of 80 then one probably would conclude the 1955 freshmen are inferior. But if one believes the two students with an HSPR are identical with respect to academic quality one probably would conclude the 1955 freshmen men are somewhat superior, etc. Regardless of what one believes with respect to quality level it is clear from the correlation coefficients Professor Dwyer presented and those routinely computed by the Evaluation and Examinations Division that the relative significance or predictive value of HSPR has remained the same. That is, those who had low HSPR's in 1936 obtained low Michigan GPA's and those who had high HSPR's in 1936 obtained high GPA's, and those who had low HSPR's in 1955 obtained low Michigan GPA's etc. The relationships were the same in 1936 as they are now.

At least two other items in Table 16 merit comment. They are concerned with the ratio of men to women in LSA, and the quality of the sexes in LSA. The number of men increased by about 20% between 1936 and 1955 but the number of women increased by over 100%. (The number of Engineering freshmen increased by about 65%.) The overall increase in University freshmen between 1936 and 1955 is about 70%

It would seem that the standards for admission to LSA, at least, have changed. Either the standards for men have been raised relative to those for women, or the standards for women have been lowered relative to men. Since the ACE scores for the 1936 LSA men and women are the same, but substantially different for the 1955 freshmen (men higher) and since the mean HSPR of the LSA men and Engineering freshmen (almost entirely men) increased several points between 1936

Table 16

Comparison of 1955 and 1936 Michigan Freshmen*

Group and Variable	LSA								
	Men			Women			Engineering		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
1955 Freshman HSPR	835	78.1	17.5	945	83.8	14.4	579	82.3	15.0
1936 Freshman HSPR	662	75.3	19.2	443	83.7	13.7	327	78.6	17.3
1955 Freshman GPA	830	2.36	.79	932	2.41	.75	574	2.39	.75
1936 Freshman GPA	683	2.26	.73	451	2.31	.73	344	2.37	.75
1955 Freshman ACE	825	123.5	20.2	944	117.1	20.4	582	122.3	19.0
1936 Freshman ACE	702	217.7	53.2	463	217.6	50.2	352	222.4	51.3

*Means and SD's for the 1955 freshmen were computed to make the statistics comparable with Dwyers. The SD's (standard deviations) reflect the variability of values about the mean. For example, the HSPR SD for the 1955 LSA men being smaller than the HSPR SD for the 1936 LSA men indicates the 1955 men are slightly more homogeneous than the 1936 men; but for the women the opposite situation exists, the 1955 LSA women are slightly more heterogeneous than the 1936 LSA women.

Different editions of the ACE were given in 1955 and 1936 so the means and SD's are not comparable.

and 1955 it would seem that the effective admissions standards have been lowered for women. If the standards for women had remained the same as those for men then the 1955 women probably would have obtained higher HSPR's than the 1936 women and would have obtained ACE scores equal to the 1955 LSA men.[31]

It is possible that the currentheavy dependence upon the principal's recommendation and the student's high school record in the admissions process results in the encouragement, recommendation, selection, and enrollment of a disproportionately large number of women. Since high school boys tend to be more "troublesome," outspoken, agressive, etc., than high school girls the boys are likely to be penalized unduly. As mentioned earlier the objective and systematic use of an aptitude test would serve to equalize the admissions opportunities and standards.

The number of University of Michigan graduates in the 1930's who are listed in publications such as "Who's Who" is in part due to the quality and nature of students selected. While it may not be crucial that Michigan's graduates of the 1960's be listed as frequently or more often it would seem that since relatively few women are listed and since the quality of students entering other institutions is increasing, proportionately fewer Michigan names will appear unless the admissions criteria are changed.

Before concluding this report some data on the performance of graduates from several high schools will be presented. Tables 17 to 22 show the quality of 1955 freshmen from six "big sending" Michigan high schools, and how they performed at the University. Of the 23 high schools in the country who sent the University 20 or more freshmen all but 1 is a Michigan high school.[32] Of the 22 Michigan schools the two with the highest University GPA's (MacKenzie High School in Detroit, and Cranbrook (22 men) - Kingswood (17 women) High Schools in Bloomfield Hills), the two with the lowest GPA's (Central High School in Flint,

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[31] It is of incidental interest to note that while the 1955 LSA men have slightly higher aptitude test scores than the 1955 Engineering freshmen the 1936 LSA men had lower scores than the 1936 Engineering freshmen.

[32] There are 31 high schools who "sent" 10 to 19 freshmen and of these 23 are Michigan and 8 are non-Michigan schools. Perhaps of greater importance in terms of the admissions problem is the fact that about 55% of all the freshmen came from schools whichsent fewer than 10 freshmen. A majority of the sending schools in Michigan as well as elsewhere sent only 1 or 2 freshmen. Among other things this suggests it might be difficult to influence these "small sending" schools to prepare their students in a manner most acceptable to the University.

McKenzie High School, Detroit, Michigan Number of Freshmen: 23

Number of Students in the High School Graduating Class: 468

Table 17

		HSPR Fifth					
		1	2	3	4	5	
	No HSPR	00-70	71-82	83-89	90-95	96-99	Med HSPR
N	0		1	4	8	10	94.4
%			4.3	17.4	34.8	43.5	

		ACE Fifth					
		1	2	3	4	5	
	No ACE	00-102	103-113	114-124	125-138	139-184+	Med ACE
N	0	4	6	6	6	1	116.3
%		17.4	26.1	26.1	26.1	4.3	

		Overall GPA									
		1	2	3	4	5	6	7	8		
Group		.0-.49	.5-.99	1.0-1.49	1.5-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0	N	Med GPA-RS
All Freshmen Having Both HSPR and ACE	N			1	2	7	3	6	3	22	2.75
	%			4.5	9.1	31.8	13.6	27.3	13.6		
Top 1/5 on Both HSPR and ACE	N								1	1	
	%										
Bottom 1/5 on Both HSPR and ACE	N									0	
	%										
Top 2/5 on Both	N							4	2	6	
	%										
Bottom 2/5 on Both	N									0	
	%										

Median GPA-RS= 2.75 Median HSPR-RS= 94.4 Median ACE-RS= 116.3

Median GPA-PR= 71 Median HSPR-PR= 78 Median ACE-PR= 45

Cranbrook-Kingswood High Schools, Bloomfield, Michigan Number of Freshmen: 39

Number of Students in the High School Graduating Class: 113

Table 18

		HSPR Fifth					
		1	2	3	4	5	
	No HSPR	00- 70	71- 82	83- 89	90- 95	96- 99	Med HSPR
N	1	26	5		5	2	62
%	2.6	66.7	12.8		12.8	5.1	

		ACE Fifth					
		1	2	3	4	5	
	No ACE	00- 102	103- 113	114- 124	125- 138	139- 184+	Med ACE
N	1	2	4	6	12	14	132.7
%	2.6	5.1	10.3	15.4	30.8	35.9	

Group		Overall GPA								N	Med GPA-RS
		1	2	3	4	5	6	7	8		
		.0- .49	.5- .99	1.0- 1.49	1.5- 1.99	2.0- 2.49	2.5- 2.99	3.0- 3.49	3.5- 4.0		
All Freshmen Having Both HSPR and ACE	N			2	3	10	10	9	4	38	2.70
	%			5.3	7.9	26.3	26.3	23.7	10.5		
Top 1/5 on Both HSPR and ACE	N								1	1	
	%										
Bottom 1/5 on Both HSPR and ACE	N					1				1	
	%										
Top 2/5 on Both	N							2	2	4	
	%										
Bottom 2/5 on Both	N					2		1		3	
	%										

Median GPA-RS= 2.70 Median HSPR-RS= 62 Median ACE-RS= 132.7

Median GPA-PR= 67 Median HSPR-PR= 10 Median ACE-PR= 74

Central High School, Flint, Michigan　　Number of Freshmen: 26

Number of Students in the High School Graduating Class: 580

Table 19

	No HSPR	HSPR Fifth 1	2	3	4	5	Med HSPR
		00-70	71-82	83-89	90-95	96-99	
N	0	5	7	4	2	8	84.3
%		19.2	26.9	15.4	7.7	30.8	

	No ACE	ACE Fifth 1	2	3	4	5	Med ACE
		00-102	103-113	114-124	125-138	139-184+	
N	0	2	9	6	4	5	117.2
%		7.7	34.6	23.1	15.4	19.2	

Group		Overall GPA 1	2	3	4	5	6	7	8	N	Med GPA-RS
		.0-.49	.5-.99	1.0-1.49	1.5-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0		
All Freshmen Having Both HSPR and ACE	N		3	3	5	8	4	2	1	26	2.12
	%		11.5	11.5	19.2	30.8	15.4	7.7	3.8		
Top 1/5 on Both HSPR and ACE	N					1	1	2		4	
	%										
Bottom 1/5 on Both HSPR and ACE	N		1							1	
	%										
Top 2/5 on Both	N					2	2	2		6	
	%										
Bottom 2/5 on Both	N		2	2		1				5	
	%										

Med. GPA-RS : 2.12　Med. HSPR-RS: 84.3　Med. ACE-RS: 117.2
Med. GPA-PR: 38　Med. HSPR-PR: 45　Med. ACE-PR: 46

Jackson High School, Jackson, Michigan		Number of Freshmen: 20

Number of Students in the High School Graduating Class: 441

Table 20

		HSPR Fifth					
		1	2	3	4	5	
	No HSPR	00-70	71-82	83-89	90-95	96-99	Med HSPR
N	0	5	5	4	5	1	82.5
%		25.0	25.0	20.0	25.0	5.0	

		ACE Fifth					
		1	2	3	4	5	
	No ACE	00-102	103-113	114-124	125-138	139-184+	Med ACE
N	0	3	4	6	5	2	119.0
%		15.0	20.0	30.0	25.0	10.0	

Group		Overall GPA								N	Med GPA-RS
		1	2	3	4	5	6	7	8		
		.0-.49	.5-.99	1.0-1.49	1.5-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0		
All Freshmen Having Both HSPR and ACE	N			2	8	6	2	1	1	20	2.00
	%			10.0	40.0	30.0	10.0	5.0	5.0		
Top 1/5 on Both HSPR and ACE	N									0	
	%										
Bottom 1/5 on Both HSPR and ACE	N				1					1	
	%										
Top 2/5 on Both	N					1	2		1	4	
	%										
Bottom 2/5 on Both	N				2	3				5	
	%										

Median GPA-RS= 2.00		Median HSPR-RS= 82.5		Median ACE-RS= 119.0

Median GPA-PR= 31		Median HSPR-PR= 39		Median ACE-PR= 52

Mumford High School, Detroit, Michigan Number of Freshmen: 126

Number of Students in the High School Graduating Class: 485

Table 21

	No HSPR	HSPR Fifth					Med HSPR
		1	2	3	4	5	
		00-70	71-82	83-89	90-95	96-99	
N	0	46	29	20	19	12	77.5
%		36.5	23.0	15.9	15.1	9.5	

	No ACE	ACE Fifth					Med ACE
		1	2	3	4	5	
		00-102	103-113	114-124	125-138	139-184+	
N	0	29	26	29	26	16	116.5
%		23.0	20.6	23.0	20.6	12.7	

Group		Overall GPA								N	Med GPA-RS
		1	2	3	4	5	6	7	8		
		.0-.49	.5-.99	1.0-1.49	1.5-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0		
All Freshmen Having Both HSPR and ACE	N		1	10	17	35	31	17	14	124	2.48
	%		.8	8.1	13.7	28.2	25.0	13.7	11.3		
Top 1/5 on Both HSPR and ACE	N								2	2	
	%										
Bottom 1/5 on Both HSPR and ACE	N			4	5	2	1			12	
	%										
Top 2/5 on Both	N				2	1	3	3	5	14	
	%										
Bottom 2/5 on Both	N		1	5	10	13	7	1		38	
	%										

Median GPA-RS= 2.48 Median HSPR-RS= 77.5 Median ACE-RS= 116.5

Median GPA-PR= 58 Median HSPR-PR= 29 Median ACE-PR= 45

Ann Arbor High School, Ann Arbor, Michigan Number of Freshmen: 82

Number of Students in the High School Graduating Class: 372

Table 22

	No HSPR	HSPR Fifth 1	2	3	4	5	Med HSPR
		00- 70	71- 82	83- 89	90- 95	96- 99	
N	1	27	18	11	16	9	79.5
%	1.2	32.9	22.0	13.4	19.5	11.0	

	No ACE	ACE Fifth 1	2	3	4	5	Med ACE
		00- 102	103- 113	114- 124	125- 138	139- 184+	
N	3	15	22	15	14	13	115.3
%	3.7	18.3	26.8	18.3	17.1	15.9	

Group		Overall GPA 1	2	3	4	5	6	7	8	N	Med GPA-RS
		.0- .49	.5- .99	1.0- 1.49	1.5- 1.99	2.0- 2.49	2.5- 2.99	3.0- 3.49	3.5- 4.0		
All Freshmen Having Both HSPR and ACE	N		4	6	9	26	16	13	6	80	2.40
	%		5.0	7.5	11.3	32.5	20.0	16.3	7.5		
Top 1/5 on Both HSPR and ACE	N							3	2	5	
	%										
Botton 1/5 on Both HSPR and ACE	N		1	1	2	2				6	
	%										
Top 2/5 on Both	N					1	2	4	5	12	
	%										
Bottom 2/5 on Both	N		3	4	5	9	3		1	25	
	%										

Median GPA-RS= 2.40 Median HSPR-RS= 79.5 Median ACE-RS= 115.3

Median GPA-PR= 53 Median HSPR-PR= 35 Median ACE-PR= 43

and Jackson High School in Jackson) as well as the school which sent the largest number of students (Mumford High School in Detroit) were selected for illustrative purposes. Data on freshmen from Ann Arbor High School are also presented This school was selected because it is the second largest "sender" and because its students obtain average grades at the University, but mostly because it is located in Ann Arbor and enrolls most of the faculty's children who are in high school!

It is obvious from the high school tables that students in the "bottom fifth on both" perform poorly at the University. Only 6 of the 21 who would have been excluded automatically obtained a GPA of 2.00 or better, 1 obtained better than a 2.49, and none obtained better than a 2.99. (If, as some of the faculty suggest, most of the students who now receive C's should not be at the University then only 1 of the 21 is a "real loss"--since all students having GPA's of 2.00 to 2.49 have received a preponderance of C grades, or more D's than B's. As indicated earlier there is a strong tendency for students who achieve unexpected GPA's to enroll in courses that grade atypically. Usually students in the bottom fifth on both who obtain high GPA's have enrolled in "soft grading" courses. The above student who obtained a GPA above 2.49 (specifically 2.53) enrolled in such courses and received an A in one of them (Course Y, Table 15).)

By contrast, of the 46 in the "top two-fifths on both" who would have been admitted automatically 44 obtained a GPA of 2.00 or better, and 30 obtained better than a 2.99. If the "open door policy for the academically able" had been in operation in 1955 it is probable that many more than 46 "superior" students from the six schools would have been enrolled.

It is worth noting that the six schools are all somewhat unique with respect to the numbers of their graduates enrolled at the University and with respect to their quality. For example the private Cranbrook-Kingswood high schools, Table 18, send over one third of their graduates to the University. While their median HSPR is low their median ACE is high and as a group they perform very well at the University. But 2 of the 39 freshmen were in the "bottom fifth on both;" one of them obtained a GPA of 2.20 and the other did not complete the first semester

It is also noteworthy that the "sending school" whose students have the highest University GPA's, MacKenzie High School, Table 17, tends not to have many of its graduates enrolled at the University; only 23 or 4.9% of its 468 graduates were enrolled. But those who enrolled had done very well in high school; only 1 had an HSPR less than 83. Of the top 10% of MacKenzie's graduating class (about 47) only 18 or 38.3% entered the University.

By contrast another large Detroit high school, Mumford, Table 21, had 126 or 25.8% of its 488 graduates enrolled at the University, but 75 or 59.5% of the 126 had HSPR's less than 83. Of the 49 in the top 10% of the graduating class 31 or 63.3% entered the University.

It is interesting to see that the median ACE scores of the MacKenzie and Mumford students who were enrolled at the University is the same.

It should be pointed out that MacKenzie High School is located in a relatively poor section of Detroit and tends to draw students from the lower socioeconomic classes, but Mumford High School is located in a "good" district and tends to draw students from the upper socioeconomic classes. The many implications to be drawn from the MacKenzie - Mumford similarities and differences will be left to the reader (e.g., children from poor homes are enrolled in the University only if they have done very well in high school but children of equal intelligence from "well to do" homes are enrolled in the University despite poor performance in high school). One final difference may be worth mentioning. It is that of the six large high schools MacKenzie has the largest proportion of graduates enrolled in the Engineering School (about 41%) and Mumford has the largest proportion of students enrolled in the College of LSA (about 97%).

The lowest GPA's are obtained by students from Jackson High School, Table 20. Only 6 or 13.6% of the 44 students in the top 10% of its graduating class entered the University.

It is apparent from Tables 17 to 22 that a relatively small percentage of the top 10% enroll in the University. More importantly the percentages for the other high schools in the state tend to be smaller. In 1955 there were about 64,000 high school graduates in the State of Michigan and 6,400 of them ranked in the top 10%, by definition. Reference to Table 10 shows that 746 of the freshmen who were graduated from Michigan high schools were in the top 10%. This means that the University enrolled about 12% of the State's top ranking graduates. Since nationally over two thirds of the top 10% (and one third of all high school graduates) go to college it is apparent that many of the State of Michigan's top 10% go to institutions other than the University of Michigan.[33] Since there are many Michigan schools who send a small proportion of their top 10% to the University it would seem that an active program of "missionary" admissions work would be profitable, especially in conjunction with the proposed admissions plan.

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[33] Data from other institutions and states for comparison purposes are difficult to obtain. Although it has no major "within state" competitors the University of Wisconsin with its relatively non-selective admissions policy enrolls about 18% of Wisconsin's top ranking 10% (i.e., Wisconsin enrolls about 50% more of its top graduates than Michigan).

Appendix A

While an extensive follow-up of the post first semester performance of the 1955 freshmen is planned,some preliminary data on some of the LSA students may be of interest. The second, third, and fifth semester GPA's of four groups of 1955 LSA entrants were obtained.

The first group consists of the 93 students who were in the bottom fifth on both HSPR and ACE and who had obtained a 1955 Fall semester GPA. (See page 32.) The second group consists of the 75 students in the "top fifth on both." Table 23 shows the 1955 Fall semester GPA's of these two groups of students as well as their performance for three other semesters. It can be seen that 56 or 60.2% of the 93 in the first group and 14 or 18.7% of the 75 in the second group did not obtain a 1957 Fall semester GPA. Of the 37 in the first group who did, 16 or 43.2% obtained their GPA in a unit other than LSA (i.e., they had transferred). The student who obtained the 1957 Fall semester GPA above 3.49 was in a unit other than LSA; his GPA had been above 2.00 each semester while in LSA. Only 10 or 16.4% of the 61 in the second group who obtained 1957 Fall semester GPA's had transferred out of LSA. The student who obtained the 1957 Fall semester GPA below .50 was also in a unit other than LSA; his semester GPA's while in LSA showed no consistent pattern, sometimes above 2.99, sometimes below 1.49.

The third group consists of the 238 students whose first semester GPA was lower than 1.50 (See page 31). In order that students from this group could complete the academic year with a GPA of 2.00 or higher it would be necessary for them to obtain a second semester GPA above 2.49 at least. Table 24 shows that of the 238, 7 were able to obtain a second semester GPA above 2.49; but only 5 of the 7 finished the freshman year with a freshman GPA above 1.99, and of these 5 only 3 earned credit for 30 or more hours. (Perhaps it should have been mentioned earlier that it is possible for a student to have a GPA of 2.50 by completing only 8 credit hours if he obtains 4 hours of B and 4 hours of C. Many weak students complete less than 15 hours and obtain a "satisfactory" GPA by withdrawing from 1 or more courses in which they are doing unsatisfactory work. Although not previously mentioned, such practices tend to decrease the apparent predictive value of HSPR and ACE, at least when GPA is used as the criterion. In other words a satisfactory GPA may give an incorrect picture of the academic progress of some students.)

Table 24 also shows that 192 or 80.7% of the 238 did not obtain a 1957 Fall semester GPA; of the 46 who did, 11 or 23.9% obtained their GPA in a unit other than LSA. It is to be noted that of the 238 who had 1955 Fall semester GPA's less than 1.50, 2 obtained 1957 Fall semester GPA's above 3.49; one of these obtained the high GPA in a unit other than LSA and the other had not been in attendance since the 1955 Fall semester. It may also be important to know that the latter student is one of the 5 in the "top two fifths on both" who obtained a 1955 Fall semester GPA less than 1.50.

The fourth group consists of the 125 students whose 1955 Fall semester GPA was above 3.49. Table 24 shows that only 7 of this group obtained 1956 Spring semester GPA's less than 3.00 and that 3 did not obtain GPA's. It is disturbing to

Table 23

Four Semesters Performance of Students in the Bottom and Top Two Fifths on Both HSPR and ACE

			GPA							
			1	2	3	4	5	6	7	8
93 Students in Bottom Fifth on Both		No GPA	0-.49	.5-.99	1.0-1.49	1.5-1.99	2.0-2.49	2.5-2.99	3.0-3.49	3.5-4.0
1955 Fall Semester	N		6	9	19	24	31	4		
	%		[illegible]	9.7	20.4	25.8	33.3	4.3		
1956 Spring Semester	N	13	2	4	11	17	31	13	2	
	%	14.0	2.2	4.3	11.8	18.3	33.3	14.0	2.2	
1956 Fall Semester	N	41		1	2	12	21	12	4	
	%	44.1		1.1	2.2	12.9	22.6	12.9	4.3	
1957 Fall Semester	N	56			4	4	9	18	1	1
	%	60.2			4.3	4.3	9.7	19.4	1.1	1.1
75 Students in Top Fifth on Both										
1955 Fall Semester	N					3	7	9	33	23
	%					4.0	9.3	12.0	44.0	30.7
1956 Spring Semester	N	1			1	3	5	11	25	29
	%	1.3			1.3	4.0	6.7	14.7	33.3	38.7
1956 Fall Semester	N	4				2	7	22	19	21
	%	5.3				2.7	9.3	29.3	25.3	28.0
1957 Fall Semester	N	14	1		1	3	8	7	20	21
	%	18.7	1.3		1.3	4.0	10.6	9.3	26.7	28.0

Table 24

Four Semesters Performance of Students Having Low and High First Semester GPA's

238 Students with 1955 Fall Semester GPA's Below 1.50		No GPA	GPA							
			1	2	3	4	5	6	7	8
			0- .49	.5- .99	1.0- 1.49	1.5- 1.99	2.0- 2.49	2.5- 2.99	3.0- 3.49	3.5- 4.0
1955 Fall Semester	N		22	49	167					
	%		9.2	20.6	70.2					
1956 Spring Semester	N	62	6	6	42	43	72	6	1	
	%	26.1	2.5	2.5	17.6	18.1	30.3	2.5	.4	
1956 Fall Semester	N	162		2	8	16	26	18	6	
	%	68.1		.8	3.4	6.7	10.9	7.6	2.5	
1957 Fall Semester	N	192			3	5	19	10	7	2
	%	80.7			1.3	2.1	8.0	4.2	2.9	.8
125 Students with 1955 Fall Semester GPA's Above 3.49										
1955 Fall Semester	N									125
	%									100.0
1956 Spring Semester	N	3						7	38	77
	%	2.4						5.6	30.4	61.6
1956 Fall Semester	N	13				1	4	17	43	47
	%	10.4				.8	3.2	13.6	34.4	37.6
1957 Fall Semester	N	31		1	2	8	8	9	37	37
	%	24.8		.8	1.6	6.4	6.4	7.2	29.6	29.6

find that 31 of the group did not obtain a 1957 Fall semester GPA and that 3 who did obtained GPA's below 2.00. (The overall GPA of these three students, however, is not far from 3.00; why their Fall 1957 GPA's dropped below 2.00 is unknown but it is possible that the explanation might be found in factors which are not usually long-lasting, e.g., severe physical illness, plans for marriage, etc.)

It is perhaps even more disturbing to find that of 77 students who obtained GPA's above 3.49 for both the 1955 Fall semester and the 1956 Spring semester 19 did not obtain 1957 Fall semester GPA's. Practically all of the 19 left the University with outstanding records before the Fall of 1957. It is probable that some of them transferred to other institutions. (Some will be interested to know that of the 77 high achieving freshmen 36 were men and 41 were women and that of the 19 who left only 5 were men and 14 were women.) Of the 125, 94 or 75.2% obtained a 1957 Fall semester GPA; of the 94 only 8 or 8.5% obtained their GPA in a non-LSA unit.

While the first and second groups are mutually exclusive, as are the third and fourth groups, there is much overlapping of students in the groups. A total of 474 students were involved in the four groups. The number who will graduate at Michigan remains to be seen; all that can be said at this time is that of the 474 who obtained Fall 1955 semester GPA's 255 did not obtain Fall 1957 GPA's. Tables 23 and 24 show that a large majority of the dropouts are to be found in groups one and three. It seems from examining the data that for most students whatever determines performance in the first semester also determines performance in the second and subsequent semesters. A few who do poorly the first semester will do well later on and a few who do well the first semester will not do quite so well later on. The implications are clear if facilities are limited.